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Telegraphists' cramp: the emergence and disappearance of an occupational disease between 1875 and 1930

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Declaration

I declare that this thesis is a result of my own work and I am the sole author. This thesis has not been submitted in any form for any degree, qualification or similar at any other University or Institution.

Barbara M Haward,

May 2019.

Abstract

This thesis is a historical, qualitative case study of the emergence and disappearance of telegraphists' cramp in the British Post Office between 1875, when it was first reported, and 1930, by which point it was in decline. Telegraphists' cramp was an occupational disease that has attracted little attention from social historians, and references in occupational health history are scarce, possibly because of the relatively short lifespan of the disease. Telegraphists' cramp was initially categorised with related occupational diseases (for example writers' cramp) as a curiosity with little further information about causation, signs and symptoms apart from the label associating it to the work of the telegraphist. It subsequently acquired much greater prominence owing to political factors. When telegraphists' cramp appeared, trade unions were developing throughout the Post Office and were challenging pay, grades and working conditions of the workforce, including effects on health. At the same time, wider interest was developing on the effects of the rapid industrialisation of society on workers' fatigue and health. Consequently, telegraphists' cramp became an important focus of medical research and government intervention. Moreover, telegraphists' cramp is of particular interest as a disease because it emerged in response to the introduction of new technology, the Morse key, into an office environment, at a time when most other occupational diseases occurred in hazardous factory environments. My thesis is thus a study of telegraphists' cramp as the first office based occupational disease.

I have devised a two-stranded social-historical model to map the changing factors shaping telegraphists' cramp through its lifecycle. First, I describe three stages in the evolution and decline of telegraphists' cramp, using a human-centred approach where the individual (worker) response is at the heart of the model, situated in and influenced by a wider context of government sociopolitical initiatives e.g. legislation, medical and scientific knowledge theories and practices, and employer (organisational) actions. Secondly, drawing on Ludwik

Fleck's theories of thought collectives, I map the interactions between the expert and lay stakeholders involved with telegraphists' cramp in response to changing medical, political and scientific knowledge and arguments during the lifecycle of the disease. This model provides a comprehensive social-historical account of the different phases in the emergence and decline of telegraphists' cramp.

Acknowledgements

Studying for my PhD has been a journey for me which has been enjoyable but immensely challenging at times. I feel I have travelled a very long way, from being a scientist to almost a social historian. I am also pleased that I have managed to uncover and research the story of the telegraphists who experienced the painful symptoms of cramp during the course of their employment in the early twentieth century.

There are many people along the way who have supported and encouraged me especially in my dark days of wondering if I could ever achieve and complete my research work. Firstly, I would like to thank Professor Steve Sturdy and Dr Gayle Davis for their supervision. Their knowledge and expertise have provided invaluable guidance to me throughout my research. The staff at the archives I have visited in the course of my research have been so helpful in directing me to the resources I needed to find. I would like to give a special thanks to the staff at the British Telecom Archive in Holborn, London. They were so helpful in finding resources for me, especially in the early days of their digital archive when there were a few issues with accessing materials.

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Table of Contents

Declaration ..... *i*

Abstract ..... *ii*

Acknowledgements ..... *iv*

Table of Contents ..... *v*

List of Figures ..... *ix*

List of Abbreviations ..... *xi*

1 Introduction 1

1.1 Background to the research 1

1.2 Literature review of occupational health in modern Britain 4

1.2.1 Public health and occupational health 4

1.2.2 A sociopolitical approach to occupational health 9

1.2.3 Occupational ill health and disease – the political roles of medical and scientific professionals 15

1.2.4 The role of the workers and trades unions 19

1.2.5 Occupational health, work science and modern factories 22

1.3 Understanding Illness and Disease 26

1.3.1 The social constructionist approach to illness and disease 26

1.3.2 Framing and classification of disease 30

1.3.3 The theories of Ludwik Fleck 32

1.3.4 Application of Fleck's model to telegraphists' cramp 36

1.4 Aims and objectives of the telegraphists' cramp research study 40

1.4.1 The research questions 41

1.5 Sources and methods 44

1.6 Synopsis 48

2 Occupational Neuroses 51

2.1 Emergence of occupational neuroses 52

2.2 Modernity, fatigue, neurasthenia and occupational neuroses 56

2.2.1 Predisposition to and acquisition of disease 61

2.3 Medical theory and diagnosis of writers' cramp 67

2.4 Early medical perspectives and commentaries on telegraphists' cramp 73

2.4.1 A neurophysiological approach 73

2.4.2 An experimental approach to telegraphists' cramp 76

2.5 Treatment of writers' and telegraphists' cramp 81

2.6 Conclusion 87

3 The emergence of telegraphists' cramp in the Post Office 91

3.1 Background 91

3.2 The Post Office Medical Service 93

3.3 Telegraphists' cramp in the Post Office 96

3.4 The coexistence of telegraphists' cramp and writers' cramp in the Post Office 99

3.5 The political telegraphists 104

3.6 Conclusion 109

4 The route to compensation for telegraphists' cramp 113

4.1 Introduction 113

4.2 Workmen's compensation 114

4.3 The case for compensation 121

4.3.1 Post Office management and telegraphists' cramp. 131

4.4 The Committee proceedings 138

4.4.1 Evidence considered 139
4.4.2 Committee recommendations and implementation 145
4.5 Telegraph equipment trials 151
4.6 Analytical models for telegraphists' cramp 155
4.7 Conclusion 159
5 The second Post Office enquiry into telegraphists' cramp 1910 to 1911 162
5.1 Introduction 162
5.1.1 Background to the 1910 to 1911 enquiry 163
5.2 The novel structure of the 1910 enquiry committee 164
5.3 An innovative enquiry methodology 168
5.3.1 Establishing the prevalence of the disease 169
5.4 A dynamic multifactorial approach to telegraphists' cramp 174
5.4.1 Multifactorial causes of the disease 175
5.4.2 Multifactorial solutions to the disease 177
5.5 Implementation of the recommendations 183
5.6 Analytical models for telegraphists' cramp 187
5.7 Conclusion 191
6 The disappearance of telegraphists' cramp 194
6.1 Introduction 194
6.2 The emergence of workplace science 195
6.2.1 Government research boards 195
6.2.2 The National Institute of Industrial Psychology 198
6.3 The study of telegraphists' cramp as an occupational neurosis 201
6.4 Telegraphists' cramp in the Post Office during the 1920s 208

6.5 Analytical models for telegraphists' cramp 214

6.6 Conclusion 217

7 Discussion 221

7.1 Introduction 221

7.2 Framing telegraphists' cramp as an occupational disease. 222

7.3 The origins of telegraphists' cramp as an occupational musculoskeletal disorder 223

7.4 A social-historical model that explains the history of telegraphists' cramp 227

7.5 Conclusion 240

8 Sources 245

Appendix A *..... 264*

Appendix B *..... 265*

Appendix C *..... 268*

List of Figures

Figure 2-1 Morse key model in use from 1880 to 1950 77

Figure 2-2 Fulton's experimental data on muscle contractions 79

Figure 2-3 Fulton's demonstration of affected coordination 80

Figure 2-4 Zander's Arm turning machine..... 84

Figure 4-1 PTCA recommendations for remedial measures 129

Figure 4-2 Hughes telegraph..... 152

Figure 4-3 Stage 1 model for telegraphists' cramp as a musculoskeletal occupational disease..... 156

Figure 4-4 Fleckian mapping of telegraphists' cramp in 1908 158

Figure 5-1 Post Office recommended posture for using a Morse key..... 179

Figure 5-2 Advertisement for a Vibroplex key 180

Figure 5-3 Baudot telegraph machine..... 181

Figure 5-4 Stage 2 model for telegraphists' cramp as a musculoskeletal occupational disease..... 189

Figure 5-5 Fleckian mapping of telegraphists' cramp in 1911 190

Figure 6-1 Stage 3 model for telegraphists' cramp as a musculoskeletal occupational disease..... 216

Figure 6-2 Fleckian mapping of telegraphists' cramp in 1927 217

Figure 7-1 Stage 1 model for telegraphists' cramp as a musculoskeletal occupational disease..... 229

Figure 7-2 Stage 2 model for telegraphists' cramp as a musculoskeletal occupational disease..... 230

Figure 7-3 Stage 3 model for telegraphists' cramp as a musculoskeletal occupational disease..... 231

Figure 7-4 Fleckian mapping of telegraphists' cramp in 1908 234
Figure 7-5 Fleckian mapping of telegraphists' cramp in 1911. 236
Figure 7-6 Fleckian mapping of telegraphists' cramp in 1927 237
Figure 7-7 Conceptual model for occupational musculoskeletal disease risk factors developed in 2001. 243

List of Abbreviations

Abbreviation	Definition
ABPMO	Association of British Postal Medical Officers
BT	British Telecom
CTO	Central Telegraph Office
DSIR	Department of Scientific and Industrial Research
HMWC	Health of Munitions Workers Committee
HSE	Health and Safety Executive
HMSO	His Majesty's Stationery Office
ICD	International Classification of Diseases
IFRB	Industrial Fatigue Research Board
IHRB	Industrial Health Research Board
NIIP	National Institute of Industrial Psychology
PO	Post Office
P&TCA	Postal and Telegraph Clerks Association
PTCA	Postal Telegraph Clerks Association
RSI	Repetitive Strain Injury / Injuries
TNT	Trinitrotoluene, an explosive material filled into WW1 shells
UKPCA	UK Postal Clerks Association
UPW	Union of Postal Workers
WCA	Workmen's Compensation Act
WHO	World Health Organisation
WW1	World War 1

1 Introduction

1.1 Background to the research

In April 1875, both *The British Medical Journal* and *The Lancet* published articles reporting a condition affecting telegraph clerks. The 17th April edition of *The British Medical Journal* contained a short paragraph entitled "Telegraph Writers' Cramp". This stated that, at a meeting of the Paris Société de Biologie a month previously, a Dr Ernest Onimus had described two cases of:

> [an] affection analogous to writers' cramp, and which is not uncommon in telegraph clerks, especially those who use Morse's instrument. They themselves call it the telegraphic complaint, and it may henceforth be designated as telegraph clerks' cramp … The best way of avoiding this affection is to change the instrument and replace the Morse Telegraph by Hughes's.

The report concluded by stating: "In England the malady is said to be unknown".[1] *The Lancet,* one week later, published a longer article in its Annotations section, titled "A Telegraphic Malady". This opened with the statement:

> something like a panic must have been caused amongst the telegraphists of this country by the announcement – for which a French physician is answerable, that their occupation exposed them to a disease which was said to be "very common amongst telegraph clerks".[2]
>
> *The Lancet* writer then commented:

[1] See editorial article "Telegraph Writers' Cramp", *The British Medical Journal*, 1875, Volume 1 (746) p 515.
[2] See editorial article "A Telegraphic Malady", *The Lancet,* 1875, Volume 105 (2695) p 585.

> Although the disease is said to be common, only one instance of it is quoted, that of a man, who, after nine years' work in a telegraph office, began to experience a difficulty in making certain signals, the attempt to do so being followed by a cramp of the hand. First his thumb failed, then the first and second fingers, and when he had recourse to his wrist as a substitute for the hand, this became disabled too. The story is likely enough, and it seems possible that we may have to add "telegraphists' cramp" to the list of those diseases which are aptly named "professional impotences".

The article continues with a more general discussion about "all other forms of "professional disorders" and deems them as "so rare as to be looked upon as curiosities". These two are the first known reports in the British medical journals of a condition that would be identified as telegraphists' cramp.

Three years later another report appeared in *The British Medical Journal.* An Italian physician, Dr Leonardo Bianchi, published a paper entitled "A Contribution on the Treatment of the Professional Dyscinesiæ". Among the cases he discussed was "a man named Santilio, who consulted me on account of an irresistible and troublesome numbness of the right arm every time that he began little and delicate operations of the hand; viz., writing or sending telegraphic despatches". Seemingly unaware of the two previous cases reported by *The British Medical Journal* and *The Lancet*, Bianchi declared this to be the "second recorded case of telegraphists' cramp".[3] It would be a further seven years before any British cases were reported. Speaking to the annual meeting of the British Medical Association in August 1882, Mr Edmund Robinson, the surgeon to the Post Office in Leeds, reported the details of four cases that had come to his attention. His report concluded that "as this form of spasm

[3] Leonardo Bianchi, "A Contribution on the Treatment of the Professional Dyscinesiæ", *The British Medical Journal*, 1878, Volume 1 (890) pp 87-89.

has never been recorded as met with among the telegraph-workers in this country, I thought they would therefore be of interest to members of this Association".[4] In 1884, a Dr Thomas Fulton, described the disease and wrote a paper for the *Edinburgh Clinical and Pathological Journal*.[5] In 1882 telegraphists' cramp was of interest to British doctors primarily for its rarity and curiosity value, but by the early twentieth century it had become a subject of much greater medical concern. By 1908, the deputy medical officer (Dr John Sinclair) at the Post Office reported that 2.75% of 19,000 (525) telegraph clerks were suffering from telegraphists' cramp exclusively associated with use of the Morse key.[6] Three years later a survey carried out by the Post Office indicated that some 60% (approximately 8000) telegraphists reported keying difficulties when using the Morse key.[7] In the early 1930s there was a decline in the use of the Morse key with the introduction of automated technology including the telephone, and new cases of telegraphists' cramp were not observed within the Post Office. The condition appeared again briefly during WW2 but then ultimately disappeared from view.[8]

My thesis has undertaken a qualitative case study of the history of telegraphists' cramp in the British Post Office between its first reports in 1875 until its disappearance in the early 1930s. Telegraphists' cramp was an occupational disease that has attracted little attention from social historians and references in occupational health history are scarce, possibly

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[4] See Edmund Robinson "Cases of Telegraphists' Cramp", *The British Medical Journal,* 1882, Volume 2 (1140) pp 880.

[5] See Thomas Wemyss Fulton, "Telegraphists' Cramp", *The Edinburgh Clinical and Pathological Journal,* 1884, Volume 1 (17) pp 369-375. Fulton worked as a telegraphist in Edinburgh whilst a student at the University.

[6] The data were collected by returns from telegraph surveyors across the Post Office network and evidence from the calculations suggests that it included most of the telegraphists employed in the Post Office between the1880s to 1908. See POST 30/3399, File I (June 18th, 1907), London: BT Archive and *Tables 1 to 6*, POST 30/3399, File II (no exact date, 1908), London: BT Archive. The latter were also submitted as evidence to the Industrial Diseases Committee in 1908. See the *Second Report of the Departmental Committee on Compensation for Industrial Diseases 1908* (London: His Majesty's Stationary Office 1908).

[7]See the findings of the Post Office Departmental Committee on Telegraphists' Cramp, *Report of the Departmental Committee on Telegraphists' Cramp 1911* (London: His Majesty's Stationary Office 1911).

[8] Kieve discusses a fall in telegraph traffic that occurred in the early 1930s, followed by an upsurge as a result of increased trade and publicity and then a further increase during WW2, due to the need for dispersed families (e.g. by evacuation) to be in communication. See JL Kieve, *Electric Telegraph A Social and Economic History* (Newton Abbot: David and Charles, 1973), pp 260-261.

because of the relatively short lifespan of the disease. Previously, historians have examined and commented on occupational health either in terms of the sociopolitical drivers for public health reform or as part of a broader social health and welfare reform with a strong focus on occupational disease resulting from exposure to hazardous substances.[9] Musculoskeletal occupational diseases, especially telegraphists' cramp have been overlooked as a specific occupational diseases.[10] I have located my thesis within the broader context of the emergence of occupational health in the early twentieth century, which involved the growing power of the workforce, their employers, medical and science professionals and the state.

1.2 Literature review of occupational health in modern Britain

1.2.1 Public health and occupational health

The emergence and development of occupational health in modern Britain has been variously defined and interpreted by historians. The literature suggests a range of definitions which provide perspectives on both occupational (or industrial) health (i.e. a state of wellness) and occupational (or industrial) ill health or disease in the workplace, although occupational exposure may not be a sole cause of an individual's ill health and disease. Occupational ill health and disease first emerged when some authors recognised it as an extension of the discussion of developments in public health into the workplace.[11] The major outbreaks of ill health and disease epidemics in Victorian Britain appeared as a consequence of rapid industrialisation and urbanisation, along with population expansion

[9] See for example, PWJ Bartrip, *The Home Office and the Dangerous Trades: Regulating Occupational Disease in Victorian and Edwardian Britain* (New York: Rodopi, 2002) and K Waddington, *An Introduction to the Social History of Medicine* (Basingstoke: Palgrave Macmillan, 2011).

[10] Although this category of diseases was recognised by early twentieth century occupational doctors who included conditions such as writers' cramp as part of an inclusive definition of occupational cramps, which were framed as occupational neuroses by the physicians of the time. See for example: JT Arlidge, *The Hygiene, Diseases and Mortality of Occupations* (London: Percival and Son, 1892) and T Oliver, *Diseases of Occupation from the Legislative, Social and Medical points of view* (London: Methuen and Co, 1902).

[11] See Arlidge *The Hygiene, Diseases and Mortality of Occupations*, and Oliver, *Diseases of Occupation from the Legislative, Social and Medical points of view.*

that resulted in poor social conditions. The development of responses to these epidemics has been reviewed by historians as part of public health, which I interpret as part of the more inclusive agenda of environmental health. Waddington suggests that the concept of public health is currently used by historians to describe a broad movement defining administrative structures, medical specialities or political ideas, rather than the view that sanitary reform was the single response to epidemics and increasing urbanisation.[12] This contemporary perspective reflects a broad, holistic approach to environmental health, beyond the provision of basic infrastructures to provide clean water, sewage and drainage systems as the prime mechanisms by which the health of a nation could be improved and preserved. Waddington argues that whilst sanitary reform was a principal factor in disease prevention and control in Victorian Britain, government intervention by way of local civic regulation "was as much about controlling the poor as about disease prevention", and therefore assumes a political dimension.[13] Linked to this was the development of overarching state public health legislation (e.g. the first Public Health Act passed in 1848), and the appointment of regional Medical Officers of Health. This government "intervention" was devolved to local government for implementation.[14]

Following on from public health legislation was the emergence of what historians have interpreted as "State Medicine".[15] The appointment of John Simon (the Medical Officer of Health for London) to the position of Chief Medical Officer of Health to the government General Board of Health in 1855 appears to have been the turning point in shifting the paradigm of public health from physical infrastructure to the medicalisation of infectious

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[12] See K Waddington, *An Introduction to the Social History of Medicine* (Basingstoke: Palgrave Macmillan, 2011), pp 230 -231.

[13] Waddington proposes that level of control varied by region of the country, because of socioeconomic resources, local policies and officials.

[14] See D Porter, *Health, Civilisation and the State (*London: Routledge, 1999), p 112. Porter suggests that the initial role of the state was to enable local government to protect their local environment, but this manifested itself as a "bureaucratic system of health administration".

[15] See, for example, Waddington, *An Introduction to the Social History of Medicine;* Porter *Health, Civilisation and the State*.

diseases, although Porter suggests there was a backlash to this by some sectors of Victorian society, who saw this action as “the paternalistic power of the government and the despotic growth of the medical profession”. Porter also comments that John Simon’s remit extended public health to include wider environmental health with the passing of legislation to include industrial pollution (atmospheric and industrial effluent).[16] Waddington proposes that the development of public health was associated with the growing influence of medical experts as technical advisors to the growing political importance of hygiene measures. However, in the area of occupational health, this had started with the appointment of workplace Factory Inspectors in 1833.[17]

Public health evolved further with the emerging science of bacteriology and greater understanding of diseases’ epidemiology and aetiology. The isolation and identification of infectious agents linked laboratory science to public health from the 1880s onwards. Waddington proposes that this added a third social dimension to health (i.e. in addition to poverty and poor nutrition) in terms of behaviour of individuals as vectors of infectious disease. In turn, this expanded “new ideologies of intervention” promoting the authority of medical experts which shifted focus back to the individual through disease notification, isolation and disinfection processes.[18] The effects of public health reform on declining Victorian mortality rates observed in the late 1800s has been the subject of much debate amongst historians, with a major theory proposed by Thomas McKeown in 1976, that improved nutrition and living standards, and not advances in medical sciences and public health, were largely responsible for this decline.[19] This was challenged by Szreter, who suggests that McKeown had underestimated the importance of public health reform, especially local government preventive health measures that were implemented. Szreter

[16] Porter, *Health, Civilisation and the State,* p 112.
[17] Bartrip, *The Home Office and the Dangerous Trades,* p 38.
[18] Waddington, *An Introduction to the Social History of Medicine*, pp 240-246.
[19] T McKeown, *The Modern Rise of Population* (London: Edward Arnold, 1976), pp 91-110.

proposes a revisionist theory based on the importance of this "public health movement", although he acknowledges that the scale of local intervention depended on local officials, resources and ideologies.[20] Whilst occupational ill health and disease is not specifically part of this revised theory of public health, similar conclusions have been drawn by occupational health historians about the nature and effects of unequal provision of resources and impacts.[21]

Where occupational health is included within the remit of the public health domain, it has either been considered as an extension of public health (e.g. Wohl) or as part of the wider inclusive social health and medicine landscape (e.g. Waddington, Porter). Wohl's history of public health in Victorian Britain is cited by occupational health historians as a relatively recent work (written in 1983) to locate occupational disease as part of the public health agenda.[22] Wohl includes working conditions and industrial accidents as part of social and economic history and industrial diseases as part of the public health agenda.[23] Rosen, in 1958, discusses "the health and welfare of the worker" as a topic in the history of public health.[24] Whilst this acknowledged that the occupational health profile of an individual could affect their employment and their broader environment (e.g. their local community), overall it was a progressivist account that focused on the beneficial role of legislation and regulation, giving the workers increasing protection from their workplaces. Rosen's contemporaries later suggested that he had argued for a broader approach where occupational disease should be

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[20] S Szretzer, "The importance of Social Intervention in Britain's Mortality Decline c1850-1914: a Reinterpretation of the role of public health", *Social History of Medicine*, Volume 1 (1) 1988, pp 1-37.

[21] See for example, AJ McIvor, *Work conditions, Occupation and Health, A History of Work in Britain* (Basingstoke: Palgrave Macmillan, 2001), pp 112- 113. McIvor comments that improvements in occupational health and safety standards were uneven and subject to reversal (e.g. in war time and economic depression).

[22] AS Wohl, *Endangered Lives – Public Health in Victorian Britain* (London: Methuen,1983), pp 257-284. Wohl examines long working hours and fatigue, women and children at work, as well as diseases contracted, legislation and factory inspection, and commentary on death rate statistics and occupation.

[23] Wohl suggests that the results of occupational disease were debility, loss of status and financial security, which impacted upon quality of life and the ultimately the health of the nation.

[24] G Rosen, *A History of Public Health (*Baltimore: The Johns Hopkins University Press,1958), pp 395-400.

considered as one determinant of an individual's health, in conjunction with poverty, social (and racial) discrimination, and employment status.[25]

Public health changed in the 1920s and 1930s, with enhanced state medicine realised through the medical professionals of "central health departments becoming involved in healthcare", and a more general focus on the general health of the population rather than, for example, specific infectious diseases.[26] Porter proposes that the emergence of social medicine was part of a new approach to public health, which she defines as a "collective social action" in relation to discussion of health and disease of groups within populations, although occupational health was not included specifically in this.[27] McIvor discusses the role of the government scientists working for the Industrial Fatigue Research Board (IFRB) as an example of the effects of intervention of state medicine in trying to improve the health of workers in the population. The IFRB evolved from the Health of Munitions Workers' Committee (HMWC) which was set up to investigate productivity problems and deficiencies in wartime labour management and this established the work science movement in Britain.[28] Earlier recognition of health hazards at work, for example, by the enactment of Factories Act legislation has generally not been interpreted by historians as a preventive intervention of state medicine, but more as a reactive measure to defined environmental threats.[29] In summary, public health has been modelled through history as a series of developmental measures evolving from the development of infrastructures and sanitary reform to reduce the

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[25] Rosen's biographers suggest that Rosen's training in medicine, sociology and public health manifested itself in a lifelong commitment to 'what he designated as "social medicine'. (See, for example B Rosenkrantz, "George Rosen- Historian of the field", *American Journal of Public Health*, Volume 69 (2) 1979, pp 165-9; M Terris, "George Rosen and the American Public Health tradition", *American Journal of Public Health,* Volume 69 (2) 1979, pp 173-176).

[26] Waddington, *An Introduction to the Social History of Medicine*, pp 249-252.

[27] Porter, *Health, Civilisation and the State,* pp 4-5. Porter reviewed the "social, economic and political relations of health between classes, social structures and organisations, pressure groups, politics and states".

[28] A McIvor, 'Manual Work, Technology and Industrial Health 1918 to 193*9', Medical History,* Volume 31 (2), 1987, pp 160-189.

[29] The first Factory Act became enable in law in 1844. For an account of this and subsequent Acts see P Bartrip and S Burman, *The Wounded Soldiers of Industry: Industrial Compensation Policy, 1833 -1897 (*Oxford: Oxford University Press, 1983), pp 54-96.

environmental threat to individuals, to the inclusion of discussions on intervention of the state to reduce this threat to groups within populations, resulting in the broad holistic social constructivist view that currently exists.

1.2.2 A sociopolitical approach to occupational health

Weindling describes occupational health in the nineteenth century as "really part of public health", with the history of occupational health also located within public health literature.[30] He establishes occupational disease and disability as expressions not only of the poor occupational health status of the workforce, but also as part of the social history of industrial societies. Weindling argues that occupational (ill) health of workers is not solely the result of exposure to industrial hazards, but likely to be the outcome of a range of interacting social factors which mediate between the workforce, their employers, state and local regulation (via legislation) and professional experts. According to Weindling, these factors contribute to the overall socioeconomic and sociopolitical approaches that have been applied to generate a "social history of occupational health". This is a more complex concept than either explaining cause-effect relationships between exposure to hazardous substances and processes and resulting ill health effects, or the use of scientific evidence and legislation to underpin risk reduction and therefore control occupational ill health and disease. Weindling's socioeconomic approach includes the effects of industrialisation on demographics and, as part of this, morbidity and mortality arising from industrialisation. Associated with this is medical and scientific observation of working conditions and industrial welfare, as well as chronic disease and disability occurring from recurrent hazardous exposure or single event incidents (for example, mining accidents). Weindling makes an important distinction between the direct and indirect role of occupational factors influencing illness and disease: direct roles being interpreted as exposure and risk factors, and indirect roles being the (possibly less

[30] P Weindling, *The Social History of Occupational Health* (London: Croom Helm, 1985), pp 2-31.

visible) social factors such as poor wages, poor social class, poor housing and nutrition, labour relations, and external environmental pollution.[31]

Social historians' interest in occupational health has emerged since the publication of Weindling's book. One reason for this may be the clear linkages that he suggested between sociopolitical relations and workplace health and their interdependence. This is not dissimilar to the linkages between sanitary reform, local government intervention and public health that historians had previously proposed, and I would argue that this justifies why occupational health can be located within the holistic environmental health paradigm. Some authors have adopted a specific perspective on occupational health in Victorian Britain. For example, McIvor focuses on three direct occupational factors: physical fatigue and strain, injury and death from workplace accidents, and exposure to toxic materials, but these all have a interdependence to the indirect social factors identified by Weindling.[32] McIvor suggests that "overstrain and exhaustion were endemic features of work before WW1", whose outcomes for the workers were "a prescribed lifestyle and a premature degeneration in workers' mental and physical health". He proposes that this resulted from a multifactorial combination of direct factors such as long working hours, work pace and intensity, work physical environment and indirect (work) factors such as low pay, lack of rest periods from work (for example, no holidays) and employer attitudes towards fatigue and exhaustion of its workforce and its expendable nature (i.e. labour viewed as being cheap and plentiful).[33] McIvor suggests (especially for the physical diseases of telegraphists' cramp and miners' nystagmus) that overstrain and exertion resulted in the "stripping of energy" from workers, which resulted in increased risk of injury and accidents, although neither of these conditions

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[31] P Weindling, *The Social History of Occupational Health,* pp 12-14.

[32] A McIvor, *A History of Work in Britain (*Basingstoke: Palgrave Macmillan, 2001), pp 112-113.

[33] A McIvor, "Employers, the Government and Industrial Fatigue, 1890-1918", *British Journal of Industrial Medicine* Volume 44, 1987, pp 724-732. McIvor discusses how labour was seen as "pure commodity" and humans as "standardised capability". One consequence of this was that employers believed in a directly proportional relationship between hours worked and output.

occurred as the result of a single event (i.e. an accident).[34] Indirect social factors such as poor housing, health and nutritional status of the workforce therefore also contributed to fatigue of workers. This interaction was also noted by Wohl in his belief that poor health resulted from the effects of poor working conditions exacerbated by poor living conditions which did not promote recovery and suggesting that workers needed "rest and a modicum of domestic comfort to recuperate after a day's work in the prevalent unhealthy workplaces".[35]

Accident rates, morbidity and mortality statistics by occupation have also been examined by historians as a surrogate indicator of prevalence of workplace injury and death, although most acknowledge the difficulties of interpreting these data to provide an accurate portrayal of injury and accidents at work. For example, McIvor suggests that whilst accident rates declined between 1880 and 1914 overall, compared to numbers in the workforce, they were industry sector dependent, with transport, dock workers and miners experiencing increasing incident rates. He notes that whilst accident rates declined, comparative mortality data showed high risk occupations, although these data include deaths from occupational disease as well as single event accidents, so I suggest it is difficult to make a clear distinction.[36] There were political aspects to the collection of these statistics. They were collected by government bodies such as the Factory Inspectorate, the Labour Board of Trade, and Registrars of Birth, Marriages and Deaths. As McIvor and other authors observe, large sections of the labour market were excluded, data were collected annually, and Factory Inspectors initially were not required to collect occupational disease, or injury and accident data affecting women workers.[37] Figlio interprets occupational accidents as part of "contract

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[34] McIvor, *A History of Work in Britain* p 116.
[35] Wohl, *Endangered Lives p 284*.
[36] McIvor, *A History of Work in Britain* pp 117-120.
[37] See McIvor, *A History of Work in Britain* p116. See also, Bartrip, *The Home Office and the dangerous trades,* p 5.
For a discussion of women's accidents and injuries, see B Harrison, "Are Accidents Gender Neutral? The Case of Women's Industrial Work in Britain 1880-1914". *Womens History Review*, Volume 2(2),1993, pp 253-275.

based social relations" in the workplace in the context of employment contracts.[38] He proposes that an injury and an illness were both an "accident at work", but this could only be accepted when employment contracts between employer and worker became a major part of social relations in the workplace. Central to this was the role of legislation: the Employers' Liability Act of 1880 and the Workmen's Compensation Act of 1897, which established protocols to routinely pay injured workers. Figlio suggests that this replaced "litigation by administration", and the main consequences of this were that workers no longer needed to establish employer liability and thereafter injuries and diseases became part of employment statistics. Whilst this would seem a plausible interpretation, as other authors have noted, this was not inclusive across all groups of workers, occupations and social classes.[39]

Exposure and risk factors in the workplace contribute to sociopolitical relations and workplace health as a discrete entity, but one whose components and the weighting assigned to them by historians vary. The term "Dangerous Trades", borrowed from a governmental committee of the same name, has been used as an all-embracing term by authors to examine the specific hazardous substances and processes within the scope of this committee, employer and worker relations, the role of legislation, government, and medical and scientific professionals as part of an approach to explain the interactions between these groups.[40] Whilst these have been reviewed by trade, occupational group or specific occupational disease, authors have focused on different issues of exposure and risk in the context of legislation (i.e. Factories Acts, Worker's Compensation Acts). With this approach the resulting occupational ill health and diseases are thought of as part of the environmental threat to the individual worker, their occupational (ill) health status and their social status in the workplace and outside (e.g. at home). As one example of this, Bartrip's

[38] K Figlio, "What is an Accident?" in Weindling, *The Social History of Occupational Health*, pp 180 -206.
[39] See McIvor, *A History of Work in Britain,* p116; Bartrip, *The Home Office and the Dangerous Trades,* p5; B Harrison, "Are Accidents Gender Neutral, pp 253-275.
[40] The Dangerous Trades Committee was set up by the Home Office in 1895, to investigate a range of hazardous industries.

emphasis on occupational health development in Victorian Britain is on the first trades which became regulated by the Home Office, from the stakeholders involved (i.e. workers, employers, trades unions, government and medical practitioners), and part of this includes discussion on the low socioeconomic status of the workforce .[41] He examines employer behaviours ie. how commercial interests were a priority over worker health, answering only to state prosecution and regulation. He suggests that employers viewed occupational health regulation as a threat in the jobs versus health economy, but also raises the question of the wider responsibility for occupational disease in Victorian Britain in the context of regulatory processes. Bartrip questions the government's unequal approach to why some diseases were regulated and others not and proposes that this was the result of public campaigning and medical expertise in being able to distinguish work related disease aetiology and resulting occupational disease outcomes. He uses dust as an example of a non-regulated hazardous material where the workers had a greater (daily working) awareness of the effects of dusts in the textile, pottery and mining industries. As there was no defined medical diagnosis supported by scientific evidence at this time, there was no subsequent disease definition and framing, nor proposals for legislation or mitigation.[42] The occupational exposure of women (as a discrete occupational group) to hazardous risks in the workplace has been used by some authors as part of a wider history of female discrimination in employment, with an association being made between prevention of occupational ill health and working hours of children and women, illustrating a strong social dimension.[43] The

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[41] Bartrip discusses the passing of the 1891 Factory Act, which empowered the home secretary to certify industries and processes as dangerous to health and make special rules for their conduct. He notes that whilst this had limited success and impact, it was the start of recognising occupational health at work. See Bartrip, *The Home Office and the Dangerous Trades,* p 285.

[42] Bartrip quotes from the records of the Sadler Committee of 1832 which in fact was set up to investigate child labour in cotton mills but took worker statements which highlighted the dust hazards. See Bartrip, *The Home Office and the Dangerous Trades,* pp 21-23.

[43] An overall summary is presented in B Harrison, *Not only the 'Dangerous Trades'. Womens' Work and Health in Britain 1880-1914 (*Basingstoke: Taylor and Francis, Basingstoke, 1996). For the white lead trades see, for example, C Malone, "The Gendering of Dangerous Trades: Government Regulation of Women's Work in the White Lead Trade on England, 1892-1918", *Journal of Women's History,* Volume 8 (1), 1996, pp15-35. See also, A Ineson and D Thom, *TNT Poisoning and the Employment of Women Workers in the First World War* in Weindling, *The Social History of Occupational Health*, pp 89-107.

authors further explain this as a model of economic regulation, using selective implementation of (protective) legislation for women and children, with resulting conflicts of interest between social classes, men and women, work and home.[44] Harrison suggests that these steps failed to both reduce occupational ill health and return women to the domestic home, thereby preserving "patriarchal social relations at work and home", although this is disputed by other scholars.[45] Relating to women at work, a broader connection has also been made about the state role in using legislation in the workplace as a social control method, rather than for environmental risk control, as part of an overall public health aim to improve the morality of the working classes and the role of the medical profession in eliminating women from the workplace.[46]

The broad subject of workers' compensation has been a part of the development of the occupational health literature. Whilst this was not specifically addressed by Weindling in 1985, this subject was addressed by Figlio in the same book.[47] As observed by Bartrip and Burman at a similar time, early regulation of processes dangerous to health provided no means to compensate affected workers, unlike the case of single event workplace accidents, where some classes of work employees could claim financial redress via the Workmen's Compensation Act 1897 provisions.[48] This Act was amended in 1906, and McIvor suggests that this happened because of "the reforming Liberal government" which was in power.[49] The

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[44] Harrison, *Not only the 'Dangerous Trades'*. pp. 224-226.

[45] Bartrip disputes this by suggesting that as early as 1840, legislation had aimed to protect males and females of all ages, and also that later legislation did not discriminate by gender either. See Bartrip, *The Home Office and the Dangerous Trades* p 279.

[46] B Harrison, "Women's health or Social Control? The Role of the Medical Profession in Relation to Factory Legislation in Late Nineteenth Century Britain". *Sociology of Health and Illness,* Volume 4, 1991, pp 469-491.

[47] K Figlio, "What is an Accident?" pp 180-206.

[48] Bartrip and Burman are somewhat sceptical about the extent of financial benefits. See P Bartrip and S Burman, *The Wounded Soldiers of Industry, Industrial Compensation Policy, 1833 -1897 (*Oxford: Oxford University Press, 1983), p219.

[49] See McIvor, *A History of Work in Britain* p121, for a discussion. McIvor suggests that the amended Act was "more liberal" because it included compensation for the six main dangerous trades, when workers could be awarded compensation for health effects and diseases resulting from exposure to: arsenic, mercury, lead phosphorus, anthrax (from working with animal skins and wool) and ankylostomiasis (a parasitic hookworm found

outcome of this was that diseases were in effect treated as accidents. Figlio suggests that not only did this approach permit "routine payments" as discussed earlier; it also allowed for "physical" occupational diseases such as miners' nystagmus and telegraphists' cramp to be added without much investigation to the schedule at an early stage. An aspect to be examined in much greater depth within my thesis.[50]

1.2.3 Occupational ill health and disease – the political roles of medical and scientific professionals

Long proposes that "the moment when a state of health transforms to a state of illness is impossible to identify, an observation which links the history of industrial health to that of industrial illness". This perspective differentiates occupational disease from occupational accidents and implies an insidious and often long time frame between cause and effect.[51] However, the nature of cause and effect relationships as part of occupational illness has been historically problematic because of the difficulties of establishing disease aetiology. Some historians have recognised that without a specific aetiology and supporting medical and scientific evidence, there are great difficulties in understanding the relationships between workers and professionals involved in occupational ill health.[52] In the second half of the nineteenth century these were medical doctors, scientists, and factory inspectors with their regulatory enforcement role being allied to government.

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in mud and dirt in mines).

[50] See Figlio, "What is an Accident?" and also K Figlio, "How Does Illness Mediate Social Relations? Workmen's Compensation and Medico Legal practices 1890-1940" in P Wright and A Treacher (eds) *The Problem of Medical knowledge - Examining the Social Construction of Medicine* (Edinburgh: Edinburgh University Press, 1982), pp 174-224.

[51] V Long, *The Rise and Fall of the Healthy Factory: The Politics of Industrial Health in Britain, 1914-1960,* (Basingstoke: Palgrave Macmillan, 2011), pp 2-14 and 213-217.

[52] See for example Harrison, *Not only the 'Dangerous Trades'*. pp 12-14.

Bartrip suggests that prior to the Factories Acts, occupational disease and disability were "the almost inevitable corollary of employment*"* and reflects on this as an outcome of the low priority attached to occupational health by politicians and medical practitioners, with the political aim of safeguarding jobs being the priority.[53] The Home Office regulated the dangerous trades through the Factory Inspectorate, who were not medical professionals, but whose remit was to enforce and prosecute. This would always be likely to result in internal political conflict within the Home Office.[54] I suggest that this is in stark contrast to historical opinion on the intervention of state medicine in the public health domain, with the appointment of high profile Medical Officers of Health, probably because public health overall represented potentially wider threats to all classes of Victorian society, although as noted earlier state intervention in occupational health did occur later in Edwardian Britain. Bartrip suggests that "occupational health reform" became part of the political agenda from the 1880s onwards, with a new sociopolitical approach to occupational health which included medical and scientific experts from that point onwards.[55] According to Harrison, the Home Office had previously used the services of medical practitioners who practised as GPs in industrial areas and who were considered "experts" in particular dangerous trades.[56] The Post Office in Britain was an exception to this by setting up a medical provision for its workforce as early as 1855 with the appointment of its first permanent Medical Officer.[57]

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[53] Bartrip suggests that those medical practitioners who campaigned for improved occupational health came from the "second rank of the medical pantheon", and that likewise, the labour movement had more interest in maintaining full employment. Bartrip, *The Home Office and the Dangerous Trades*, pp 1-7.

[54] See Bartrip, *The Home Office and the Dangerous Trades*, p35.

[55] See Bartrip, *The Home Office and the Dangerous Trades*, p284. Bartrip suggests that this was the result of a combination of Factory Inspectors being forced to collect occupational health data, some high profile victims' cases in the media, and the presence of "moral entrepreneurs" working to get occupational health on the political agenda.

[56] Harrison discusses medical officers as being "in the service of the state" giving the examples of Thomas Arlidge (in the Staffordshire potteries), and Thomas Oliver (a hospital physician, interested in occupational medicine). See Harrison, *Not only the 'Dangerous Trades',* pp166-167.

[57] Although the Post Office did not pursue any hazardous trades. For an account of the setting up of the Post Office Medical Service in 1855 see K McIlvenna, D Brown and D Green, "The Natural foundation of Perfect Efficiency' Medical Services and the Victorian Post Office", *Social History of Medicine* published online January 23rd 2019. Available from http://dx.doi.org/10.1093/shm/hky123, last accessed 10/05/2019.

Historians acknowledge that although occupational health reform in the workplace was developed with the Liberal government welfare reforms of 1906 to 1914, this was less about hazardous risks and exposures in the workplace as about concerns about the poor health, fatigue and fitness status of the British population and, later, the WW1 effort.[58] These welfare reforms progressed workplace health and safety, and involved a mix of interested parties across industry, rather than solely scientists and medical doctors.[59] Bartrip discusses the use of doctors as medical referees for workers who had sustained accidents, a practice that had been in force since the 1897 Worker's Compensation Act.[60] He examines this in terms of the doctor's role to certify fitness for work following accidents but does not extend this to include occupational disease. In my view, this narrow focus contributes to a view that the doctor's role in dealing with occupational disease in Victorian Britain is not well researched by historians other than through generic discussions on the emergence of occupational medicine.[61] Factory doctors working "in collusion" with the state and factory managers to conceal hazardous health exposures are discussed in the context of women munitions workers in WW1.[62] The outcome of this "management-medical" approach was the formation of a TNT explosives advisory committee (which also included scientific staff from the Medical Research Committee). This committee produced regulations which included the roles of factory medical doctors, the use of protective equipment and controlled work rotation which removed employees from constant exposure to TNT. Ineson and Thom present the role of

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[58] See for example, AJ McIvor, "Employers, the Government, and Industrial Fatigue in Britain 1890-1918", *British Journal of Industrial Medicine*, Volume 44, 1987, pp 724-732.

[59] J Melling, "The Risks of Work and the Risks of Not Working: Trade Unions, Employers and Responses to the Risk of Occupational Illness in British Industry c1890-1940s" (London: ESRC Centre for Analysis of Risk and Regulation, 2003); *ESRC Discussion paper 12*. Melling suggests that employers, trade associations, insurance companies, trades unions, engineers and scientists were all involved with this.

[60] PWJ Bartrip, *Workmen's Compensation in Twentieth century Britain (*Aldershot: Gower Publishing Company Ltd, 1987); pp72-74.

[61] See, for example, ME Rose, 'The Doctor in the Industrial Revolution', *British Journal of Industrial Medicine,* Volume 28, 1971, pp 22-26, WR Lee, 'Emergence of Occupational Medicine in Victorian times'*, British Journal of Industrial Medicine*, Volume 30, 1973, pp 118-124.

[62] A Ineson and D Thom, 'TNT Poisoning and the Employment of Women Workers in the First World War' in Weindling*, The Social History of Occupational Health.* The authors describe how once the Ministry of Munitions discovered the filling of shells with TNT resulted in toxic jaundice in the workforce, the Ministry concealed this information in an effort to maintain rates of shell production. This led to secrecy and censorship of the press.

the factory doctor as a “medical administrator” who was able to manage the female workforce because the power of medical knowledge overruled the female workers’ objections to the work and especially because of the level of censorship of health information.[63]

McIvor discusses the setting up of government research boards using government employed scientists as a response to government concerns regarding the efficiency and production issues of WW1, initially the Industrial Fatigue Research Board (IFRB) which later in 1928 became the Industrial Health Research Board (IHRB).[64] The purpose of the IFRB was to research specific workplace issues, by means of psychological and physiological experiments, and to provide employers with work standards and guidelines, but this did not include hazardous substances. McIvor argues that whilst the primary motivation of the IFRB was to improve standards of workers’ health, this was not a totally philanthropic goal, because ultimately improved standards of worker fitness and health affected profit margins in British industry, so there was strong political influence. McIvor suggests that despite the extensive work of the IHRB (which was also not often well publicised), there were still “stark inequalities of occupational health standards and worker health experience between new and traditional industries”. The National Institute of Industrial Psychology (NIIP) was formed in 1920 and its founders were a subset of the IFRB Committee, although it was privately funded by industry.[65] Professor CS Myers (a Cambridge psychology professor) was appointed institute director. It was not intended to be a direct competitor to the IFRB and IFRB staff undertook industry based research and worked cooperatively with NIIP staff especially in the area of “fatigue studies” according to McIvor.[66] Sellers, within the American

[63] Ineson and Thom, pp 95-96. This was underpinned by MRC Applied Physiology laboratory research on physiological cause–effect relationships and decisions regarding provision of advice on personal protective equipment.
[64] McIvor, “Manual work, Technology and Industrial Health 1918 to 1939”, pp 160-189.
[65] They included Professor CS Sherrington, Dr L Hall and Professor EH Starling.
[66] McIvor, “Manual work, Technology and Industrial Health 1918 to 1939”, pp 173-4.

context, has examined the role of the industrial hygienist as a scientific professional in the workplace.[67] He argues that the work carried out in the early twentieth century by hygienists laid the foundations of modern environmental health, as a result of measures that were adopted by the government and employers to address the effects of poor working environments. This enabled a broadening of the definition of occupational health to workplace environmental health. Sellers discusses the social and economic responsibilities of the role, and the need to "secure confidence of both workers and employers". Constructing accounts of occupational exposure from workplace measurements and employee accounts of exposures and illness and increasing scientific knowledge is also part of this. I would argue that this contributed to establishing disease and exposure aetiology, although Sellers makes the point that, whilst this was relatively easy for the "known substances" it could be problematic for new materials and processes.

Politically, occupational health was not considered a priority in the mid-1800s as labour movements were more interested in full employment. This changed after the implementation of successive Factories Acts and the appointment of factory inspectors who were latterly required to collect occupational disease data. There was also a strong moral campaign for adding occupational health to the political agenda as a way of both improving worker health and general health of the British population in the late 1880s.[68] From this point forwards occupational health remained on the political agenda not only through the Liberal reforming governments between 1906 to 1914, but by the expansion of occupational health to include the establishment of government funded research boards employing scientific professionals conducting experiments and collecting empirical data in the workplace.

1.2.4 The role of the workers and trades unions

[67]CT Sellers, *Hazards of the Job*. *From Industrial Disease to Environmental Health Science,* (London: North Carolina Press, 1997), pp1-12.
[68] See Bartrip, *The Home Office and the Dangerous Trades*, pp 293-287.

The role of the workers and their collective voice (i.e. the trade unions) have been emphasised in different ways by historians of occupational health, particularly for trade unions where some authors suggest they contributed to poor workplace safety culture by encouraging and pursuing compensation claims at the expense of prioritising occupational health issues.[69] Some authors have focused on specific aspects of the dangerous trades workers and their campaigns for better working conditions. For example, Harrison argues that the matchmaking strike at Bryant and May in 1888, whilst not primarily concerned with the hazardous work using phosphorus and the subsequent contraction of jaw bone necrosis provided a focus on the dangerous trades by medical and scientific professionals, women workers and, trade union activism.[70] In a similar vein, Bartrip discusses the role of female consumers, female factory inspectors, commissioners on Royal Commissions and the Women's Trade Union League (WTUL) as having had influence in driving change to the dangerous trades processes.[71] Melling suggests a dual level operational model for the trade unions, with individual bargaining power for the workforce (micro level) and a policy making and legal framework for dealing with prevention and compensation (macro level). Melling takes the view that the trade unions recognised no conflicts between compensation and safe work, although a balance was needed between the risks of a known process and the implementation of stricter health and safety standards (for example the productivity of coal mining).[72] The concept of workers accepting risk based on the probability of short term injury or death is suggested by Melling to indicate a level of risk acceptance that could be mitigated

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[69] Melling, *The Risks of Work and the Risks of Not Working.* Melling refers to the earlier work of Bartrip and Weindling here.

[70] According to Harrison, the strike was primarily about payments and fines, but also included working conditions and workers' health. See B Harrison, "The Politics of Occupational Ill Health in Late Nineteenth Century Britain: the case of the match making industry"*. Sociology of Health and Illness*, Volume 17 (1),1995, pp 20-41.

[71] Bartrip discusses the role of women's' associations e.g. the Ladies Sanitary association and banning the sale of readily available consumer products containing Arsenic such as wallpaper and home decorations. The WTUL were also at the forefront of driving exclusions of groups of dangerous trades' workers from work if they were exhibiting ill health symptoms. See Bartrip, *The Home Office and the dangerous trades,* p 272.

[72] Melling, The Risks of Work and the Risks of Not Working.

by the payment of a wage premium and is a valid assumption given the low socioeconomic status of most industry workers. However, he also argues that levels of acceptable risk would have had political and technical dimensions, with a trade off between the different interests of those involved and possible solutions.

One good example which illustrates the interaction of employees, trade unions employers and experts is that of the diagnosis and compensation of silicosis in Britain.[73] Legislation to compensate for the effects of silica inhalation was enacted in 1918 once the disease's aetiology had been established, but as Bufton and Melling comment, this was "the orthodox view of silicosis" created by the Medical Factory Inspectorate of the Home Office, with compensation wholly depending on private industry funding. They suggest that this approach to compensation was based more on insurable risk than medical knowledge, hence politicisation occurred at an early stage, with accepting liability a difficult issue for employers, insurers, government and also coal miners, who were excluded until 1928. Trade unions (including coal miners) played a significant role in public debates, and challenged technical, scientific and compensation criteria, which also highlighted differences between medical and scientific experts. Bufton and Melling conclude that, ultimately, the consensus on silicosis, being like other occupational diseases, was arrived at through a combination of political, cultural and technological advances supported by "networks of influence", which included the workforce and trade unions, although coal miners were not satisfied about the lack of action on coal dust and had to wait until 1929 for recognition of their work related health issues.[74] Melling suggests that the use of diagnostic technology (and the scientists involved, who are workers themselves by definition) has a role in the detection and regulation of occupational health with not only a quest for precise diagnostic measurement, but involvement in setting

[73] MW Bufton and J Melling, "Coming up for Air: Experts, Employers and Workers in Campaigns to be Compensate Silicosis Sufferers in Britain 1919-1939", *Social History of Medicine,* Volume 18 (1), 2005, pp 63-86.
[74] Bufton and Melling suggest that this conclusion of a consensus approach to disease was shared by many historians. See Bufton and Melling, "Coming up for Air".

standards for regulation and compensation.[75] This is probably more evident in early twentieth-century America, where industrial hygienists in the workplace fulfilled this role.[76] As one of the aspects of worker involvement with acceptance of disease aetiology, Melling discusses the use of "lay epidemiology" of respiratory illness which Welsh coal miners used as evidence to scientific experts in government. This was generated from practical understanding of everyday risks and the collective impact of hazards on the lives of local communities and workers.[77] This interpretation of worker involvement in the campaign for silicosis illustrates how a workplace hazard was broadened into the wider environmental health domain and reflects the beginnings of a more inclusive approach to occupational health that started to develop between the wars in Britain.

1.2.5 Occupational health, work science and modern factories

There was a change in focus on occupational disease and ill health in the work force during and after WW1. This was the result of measures that were adopted by the government and employers to address the effects of poor human efficiency and fatigue on production. This is recognised by historians who have reflected this shift from focusing on the internalisation of the physiological effects of hazardous material exposure on the human body to externalising the individual worker as a component of a much larger physical system (i.e. a man-machine environment), where physical and psychological workplace factors assume greater importance as part of strategies to manage labour power.[78] This concept is explored further

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[75] J Melling, *"*Beyond a Shadow of a Doubt? Experts, Lay Knowledge and the Role of Radiography in the Diagnosis of Silicosis in Britain, 1919-1945". *Bulletin of the History of Medicine*, Volume 3, 2010, pp 424-466.
[76] See CT Sellers, *Hazards of the job. From Industrial Disease to Environmental Health Science,* D Rosner and G Markowitz, *Deadly Dust, Silicosis and the Ongoing Struggle to Protect Workers Health* (Ann Arbor: University of Michigan Press, 2006 (first edition 1991), pp 236-244.
[77] J Melling, *"*Beyond a Shadow of a Doubt?".
[78] Sturdy discusses this as part of an interpretation of workers' bodies as components of an industrial production system. See S Sturdy, "The Industrial Body', in RJ Cooter and JV Pickstone (eds*), Medicine in the Twentieth Century* (New York: Rodopi, 2000). See also A Rabinbach, *The Human Motor, Energy, Fatigue and the Origins of Modernity (*Berkeley and Los Angeles: University of California Press, 1992), pp 217-234.

as part of a broader literature that relates human physiology to energy consumption and efficiency in the workplace. Management of labour power through the health and efficiency of the workforce and related physiological studies emerges as central to this. Rabinbach discusses labour power in the nineteenth century in terms of the "human motor", an abstract metaphor which connects nature, industry and human activity (influenced by physiology, medicine, psychology, politics and industrial economies) originating from the energy conservation law of Helmholtz.[79] Rabinbach suggests that this later evolved into a "far more detailed scientific programme for transforming and deploying labour power". He proposed that the expertise of a diverse group of European scientists and social politicians resulted in a new science of work which would later become part of a social modernity strategy and, according to Rabinbach, "one that attempted to solve social problems through empirical research and rational principles*".* In the early twentieth century the empirical focus on energy adopted in France and Germany and its translation to the workplace was effectively challenged according to Rabinbach, by a direct confrontation emanating from the engineering skill based principles of Taylorism as an alternative work science methodology.[80]

McIvor suggests that Britain was slow to adopt these work science approaches because of employers' traditional approaches to industry and aversion to empirical research in this area, although the setting up of the IFRB (later the IHRB) did look at specific physical, psychological and work environment components of specified job roles and occupations. He suggests that their research output "significantly extended knowledge of the human factor in industry" and that their reports were acted upon by industry management groups and the industrial welfare society.[81] McIvor also suggests that "Taylorist ideas" permeated manufacturing industry from 1914 to the 1950s and that progressivist employers adopted a

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[79] A Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity.* p24.
[80] Rabinbach evaluates this as part of a chapter in his book, which addresses the "*Americanisation of Labour Power*". pp 239 – 270.
[81] McIvor, *A History of Work in Britain*, *1880-1950*, pp130-145.

welfarist role to improve working conditions with best practice approaches to support the workforce that were ahead of changes to state legislation.[82] Whilst the net effect of this would be an overall improvement in health and welfare standards at work, there was a resultant shift in emphasis away from specific occupational diseases and their poor health outcomes for the workforce. Thomson suggests that the rise of psychology in industry was related to societal concerns about the development of the industrialised world and the belief that psychology could provide a tool for understanding and defining the mental and ethical issues of industry as well as the economic.[83] He argues that the idealism of industrial psychology and the setting up of the NIIP, promised a "new understanding" for the workers, trade unions, employers, business owners and investors. However, in practice the scientists working within the discipline struggled to be seen as different to efficiency engineering practitioners (such as those practising Taylorism), despite trying to present a human centred approach to members of the workforce.[84] As a result of the low regard with which the psychologists were viewed by workers in industry, Thomson suggests that the NIIP studies were often focused on the female workforce e.g. fatigue and hours of work in the laundry trade, and were largely undertaken by the female investigators of the NIIP and IFRB, as if to emphasise the lowly role of female workers.[85]

Investigating the politics of industrial health post WW1, Long has taken a "healthy factories" approach and proposes a positive definition of occupational ill health and disease which could be applied to historical analyses of factory life in the aftermath of WW1 as a "broadly conceived model of health which embraced physical and mental well-being in all spheres of

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[82] McIvor, *A History of Work in Britain*, *1880-1950*, pp 93 -105.
[83] See M Thomson, *Psychological Subjects: Identity, Culture, and Health in Twentieth Century Britain* (Oxford: Oxford University Press, 2006), pp 140-141.
[84] See M Thomson, *Psychological Subjects: Identity, Culture, and Health in Twentieth Century Britain* pp 146-147.
[85] See M Thomson, *Psychological Subjects: Identity, Culture, and Health in Twentieth Century Britain* p147. Interestingly one of the investigators into laundry work was May Smith who later worked on the Telegraphists' Cramp study in the Post Office in 1927.

life".[86] She contrasts this with a recent government review of the health of the British working age population (where the focus was on preventing ill health at work as part of a government "good health is good business" strategy).[87] The "healthy factory" is thus presented as a space to reframe work relationships and interactions between production, consumption, work, health and leisure. There is no doubt that this concept could be applied to the new factory developments in the south east of Britain where new (lighter manual) production methods in bright modern buildings, replaced older dangerous, but not so easily to small business and the traditional heavy industries further north and west in Britain. Historians have suggested that for example in mining, shipbuilding, and the textile industries deteriorating working conditions prevailed as a result of lack of machinery maintenance and equipment, lack of cleanliness of old factory buildings and safety.[88] Jones, for example, suggests that these factors, coupled with the economic depression, resulted in an increase in levels of respiratory disease at a higher incidence in the lower socioeconomic groups with low or no incomes (either from short time working or becoming unemployed), especially amongst Lancashire textile factory workers.[89] There is evidence that there was a step change in approach to workplace health and disease from occupational ill health at work to health at work in the interwar years. However, despite the development of the new "healthy factories", inequalities in experience of health at work based on occupation, gender, class and geographical region persisted. The "healthy factory" environments generated new occupational diseases related to production rates, work pressures, monotony and repetition, later to be labelled as "work stress" by occupational health professionals, but I would argue that this was a reframing of the older recognised problems of worker fatigue.

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[86] V Long, *The Rise and Fall of the Healthy Factory,* pp 2-14 and pp 213-217.
[87] C Black, *Working for a Healthier Tomorrow: Review of the Health of Britain's Working Population* (London: HSE Books, 2008).
[88] McIvor, *Work conditions, Occupation and Health*, pp 93-105. See also H Jones, *Health and Society in Twentieth Century Britain* (Harlow Essex: Longman Group, 1994), pp 70-76.
[89] H Jones*, Health and Society in Twentieth Century Britain* p70.

1.3 Understanding Illness and Disease

1.3.1 The social constructionist approach to illness and disease

The social construction of illness and disease has been interpreted as a useful perspective with which to "organise" both medical sociology and the social history of medicine, although it is evident that there are difficulties with trying to find a single agreed definition or model.[90] There is, however, agreement on the social nature of illness and disease.[91] Wright and Treacher propose that medicine should be viewed as a social construction with no separation of medical and technical knowledge from human centred activities and social factors.[92] Rosenberg in 1992 suggests that identification of an illness and subsequent naming of a medical condition is key to understanding it as a cultural and social phenomenon and that the naming process in itself is central to social and medical thought. He further suggests the use of the term "framing" as a more inclusive term than the "social construction" of disease. The latter, he argues is only one aspect of the multifaceted nature of disease.[93] Brown attempts to distinguish further between the social construction of medical knowledge and the social construction of illness, the former dealing with professional beliefs and the latter with the "illness experience". He discusses "making social sense" of health and illness across three levels:

- Microlevel: self-awareness, individual action, interpersonal communications.
- Mesolevel: hospitals, medical education.
- Macrolevel: national health status, health policy, economics, health systems.

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[90] See for example P Brown, "Naming and Framing: The Social Construction of Diagnosis and Illness", *Journal of Health and Social Behaviour*, Volume 35, 1995, pp 34-52; L Jordanova, "The Social Construction of Medical Knowledge", *Social History of Medicine,* Volume 7, (3), 1995 pp 361-381.

[91] See for example, Brown, "Naming and Framing"'; C Rosenberg, "Framing Disease: Illness, Society and History", in C Rosenberg and J Golden (eds.), *Framing Disease: Studies in Cultural History* (Rutgers: Rutgers University Press, 1992); pp xiii-xxvi; P Wright and A Treacher, "Introduction", in P Wright and A Treacher (eds) *The Problem of Medical Knowledge – Examining the Social Construction of Medicine,* pp 1-22.

[92] Wright and Treacher, "*Introduction",* pp10-12.

[93] Rosenberg, "*Framing Disease",* pp xiii-xxvi;

Brown also proposes that identification of social causation of health status is a major element in the health and illness debate and is necessary for a "complete medical sociological view". Brown defines the stages of the social construction of an illness, summarised as follows:

- Identification and diagnosis (social discovery of disease, the role of lay persons, professional interventions, organisational factors).
- Different experiences of illness which results in ever changing construction of illness (social perception and interaction, framing of aetiology.)
- Treatment (construction of appropriate ways to treat disease, politicisation related to social allocation of treatment, further medicalisation through treatment).
- Outcome (personal, organisational and social factors which may determine belief in success).[94]

This approach usefully identifies the different aspects of the social construction of illness, although I argue it could be more useful if it interfaced with medical technical knowledge and professional beliefs. Rosenberg's model suggests that the discrete disease entity results from medical professional and patient interactions, becomes labelled or framed and then can serve as "social actor and mediator".[95] This can be viewed as a hierarchical process, and this is much like Brown's model. At the lowest level, there are the perspectives of those affected (i.e. the patients) and their interaction with medical practitioners. Next are the social relationships within medicine and medical structures, where there may exist divisions of labour between medical practitioners and nurses as part of patient management. At the highest level are the processes whereby health and disease are conceptualised (i.e.

[94] Brown, "Naming and Framing: The Social Construction of Diagnosis and Illness".
[95] See Rosenberg, *Framing Disease,* pp xiii-xxvi.

diagnosed, labelled and medicalised), and the contribution to, and influence from many parts of society.[96] However, both of these approaches only make sense if the verbal and visual language used by medical professionals and the persons affected by the disease are shared language.[97]

Many authors cite Foucault's theories as relevant to the social construction of illness and disease. [98] Other authors do not agree suggesting rather that his main focus was on the status of clinical examination and modern medicine as a doctor patient discourse.[99] Foucault discusses the role of the clinical medical professionals' "observing gaze" as a mechanism to isolate disease features, signs and symptoms and then to recognise and classify them.[100] The "observing gaze", however, takes no action and needs to use language and hearing to identify timescales, memory and successive incidents by dialogue with the patient. This is then followed by speech from the clinician to prescribe treatment or another course of action. In Foucault's view, the patient's clinical experience is a balance of the hearing, speaking and the observing gaze.[101] The clinical experience is therefore a new knowledge form with a scientific discourse developed around "the visible and the expressible" and the organisational structure of the clinic.[102] Other authors argue that Foucault's prime interest was in the concept of medical power and the growth of medicalisation, achieved through a medical discourse between patient and medical practitioner, one that creates its own objects of analysis using specific language that is of significance only in the context of the discourse

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[96] Jordanova, "The Social Construction of Medical Knowledge".
[97] See for example, Jordanova, "The Social Construction of Medical Knowledge". Rosenberg also makes this point about interactions of biological and social events in his definition of disease. See C Rosenberg, "*Framing Disease".*
[98] See for example, Wright and Treacher, "Introduction" and D Armstrong "The Doctor- Patient Relationship: 1930-1980" in P Wright and A Treacher (eds) *The Problem of Medical Knowledge – Examining the Social Construction of Medicine,* p119.
[99] Jordanova, "The Social Construction of Medical Knowledge".
[100] M Foucault, *The Birth of the Clinic* (London: Tavistock Publications, 1973), p89.
[101] Foucault, *The Birth of the Clinic*, p115.
[102] Foucault, *The Birth of the Clinic*, p196.

(e.g. lesion, medical examination).[103] Rosenberg further suggests that by taking a social constructionist view of disease, some historians have interpreted disease definition and unproven aetiologies as tools of social control and labels for deviance in order to legitimise "status relationships" and the rise of medical professionals as agents of the medicalisation of society.[104] An example of this is the nineteenth-century "disease" chlorosis, which affected middle-class adolescent females. Figlio argues that this was created (or framed) by physicians to promote the ideological work of medicine in supporting social class division and capitalist production.[105] However, the social constructionist approach, according to Rosenberg, has failed to acknowledge the process of disease definition and the subsequent impact of this for individuals in terms of social policy and medical care provision. Another aspect of social legitimisation is the desire to designate a specific somatic model of disease (i.e. one which has a defined and agreed aetiology among medical professionals) as part of framing and therefore justify its existence in the social environment.[106] Rosenberg also proposes that the relationship between individuals affected by disease and their relationship with their social environment is influenced by whether the disease is framed as a long term (chronic) or short term (acute) entity with the associated demands for medical and social care from health professionals and the government. One outcome of this could be that disease thus becomes part of social identity.[107]

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[103] For further discussion of this see for example, Wright and Treacher, "Introduction", pp 5-7.
[104] Rosenberg, "Framing Disease: Illness, Society and History".
[105] K Figlio, "Chlorosis and Chronic Disease in Nineteenth- Century Britain: The Social Construction of Somatic Illness in a Capitalist Society", *Social History*, Volume 3 (2), 1978, pp 167-197.
[106] C Rosenberg, "Disease in History: Frames and Framers", *The Milbank Quarterly*, Volume 67, supplement 1, 1989, pp 1-15.
[107] Rosenberg, "Framing Disease: Illness, Society and History".

1.3.2 Framing and classification of disease

Workers have self framed occupational diseases for many centuries by way of verbal labelling of conditions associated with specific trades or work tasks within those trades.[108] These names assigned by verbal labelling entered work culture long before aetiology was established and often before involvement of medical professionals and scientists. Whilst most historians defer to Ramazzini as being one of the first medical practitioners to document occupational disease, origins of verbal labelling by the workers do not appear to have been researched to any extent.[109] Verbal labelling also varied by region and industry, thus people working in the pottery towns in Staffordshire were familiar with potters rot, and those in coal mining areas with miners' phthisis: both were later identified as silicosis. Another important point about verbal labelling is that it was largely based on signs, symptoms and health outcomes, so this adds to the perspective of workers' self labelling and framing, which can be interpreted as providing a lay view of illness. Workplaces were also labelled by the workers in relation to occupational disease. For example, "white cemetery" was a name adopted by women who worked in white lead works, as it was acknowledged that the outcome of lead poisoning was fatal and this in turn was associated with a "fatalistic attitude" towards work.[110] Although there are regional and cultural aspects of self framing relating to local and historical knowledge, the issue of how workers recognise and construct previously unfamiliar occupational diseases is a different and important one of relevance to telegraphists' cramp. Dembe suggests that encounters with new diseases are constructed with a self-validation process whereby workers integrate observed ill health effects and the

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[108] Commonly encountered names are "potters rot", "miners' lung", "wool sorters disease", "phossy jaw", "writers' cramp". For example see A McIvor, *Miners' Lung: A History of Dust Disease in British Coal Mining* (Oxford: Ashgate, 2007); Bartrip, *The Dangerous Trades*; A Dembe, *Occupation and Disease - How Social Factors Affect the Conception of Work-Related Disorders* (London: Yale University Press, 1996).

[109] Bernardo Ramazzini an Italian physician first explored and documented the relationships between occupational activities and the development of hand and wrist disorders in 1713. Cited by Dembe in *Occupation and Disease,* p27.

[110] Harrison, *Not only the 'Dangerous Trades*, p 61, p73.

presence of factors in their work environment from knowledge gained from a range of sources, including medical diagnosis, accounts from other workers, information in the public domain (for example newspaper articles) and friends and relatives.[111]

In addition to self framing by workers, diseases have been formally classified since the nineteenth century. In the present day, Bowker and Starr define classification as "a spatial, temporal or spatiotemporal segmentation of the world" and then describe a classification system as "a set of boxes into which things can be put". They further qualify this by analysing the properties of a classification system as having consistent principles, mutually exclusive properties, and as being complete (i.e. inclusive of all the items, areas or actions being classified).[112] The major medical classification scheme in current use, the International Classification of Diseases (ICD), originated in the nineteenth century. It has since been used globally to collect and classify morbidity and mortality information.[113] William Farr, the first medical statistician of the General Register Office of England and Wales, is credited with the development of the ICD classification model dating from 1855.[114] His model classified statistical data on diseases into 5 groups: epidemic diseases, constitutional or general diseases, local diseases arranged by anatomical site, developmental diseases and, injuries. In 1855, Farr's classification and that of a colleague D'Espine, classified diseases by their symptom base, were accepted by the 2nd International Congress and later known as the International List of Causes of Death. From 1855 forwards, mortality and morbidity statistics were compiled by the Registrar of Births, Marriages and Deaths, recording categories of

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[111] Dembe, *Occupation and Disease*, pp 5-8.
[112] See GC Bowker and SL Starr, *Sorting Things Out, Classification and its Consequences* (London: The MIT Press, 2000), pp 10-11.
[113] Bowker and Starr*, Sorting Things Out, Classification and its Consequences,* p21.
[114] The World Health Organisation (WHO), "History of the development of the ICD"*, in WHO ICD10 Online*, www.who.int/classifications/icd/en/, last accessed 10/05/2019.

trade and occupation, and recorded accident and injury numbers, rather than specific diseases and the disabilities arising from them.[115]

1.3.3 The theories of Ludwik Fleck

Ludwik Fleck was born in Poland in 1896 and studied medicine specialising in bacteriology. He published widely in this field and researched infectious diseases and cytoserology. He also researched and published in the area of the scientific methodology of observation and principles of medical knowledge, whilst continuing to research in microbiology and working on the serology of the Wassermann reaction used for the detection of syphilis. [116] Early in his book, Fleck introduces the reader to the disease entity concept as part of his discussion on the concept of syphilis and comments that:

> current research techniques are the result of historical development. Even the modern concept of disease entity is an outcome of precisely such a development and by no means the only logical possibility. It is possible to dispense with the concept of disease entity altogether and to speak of various symptoms and states of various patients and incidences.[117]

Fleck acknowledges that disease is a much wider concept than a medical definition, involving social factors and also the need for "organised cooperative research supported by popular knowledge" from which a "unified picture might emerge, for the development of the disease phenomena requires decades". At this stage Fleck is also recognising the interaction between research conducted by the experts and the experience of laypersons and

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[115] McIvor, *A History of Work in Britain, 1880-1950,* pp 117-125.
[116] Flecks published his work in 1934. See L Fleck, *Genesis and Development of a Scientific Fact* (Chicago: University of Chicago Press), second edition, edited by T Trenn and K Merton, 1979), p163.
[117] Fleck, *Genesis and Development of a Scientific Fact,* p21.

introduces the concept of “thought collectives”. He introduces thought collectives by way of defining cognition and its relationship to “that which is known”. Previous knowledge influences methods of cognition and in turn this “enlarges, reviews and gives fresh meaning to what is already known”.[118] Fleck suggests that this is the outcome of social activity, since the enlarging of knowledge requires more than one individual to be involved. His formal definition of a thought collective is as follows:

> if we define thought collective as ‘a community of persons mutually exchanging ideas or maintaining intellectual interaction’, we will find by implication that it provides the special ‘carrier’ for the historical development of any file of thought as well as for the given stock of knowledge and level of culture. This we have designated thought style.

Fleck makes the point that whilst thought collectives consist of individuals, the individual within the group is “never or hardly ever conscious of the prevailing thought style”. An example of this cited by Fleck relates to “formal aspects of scientific activities” and their social structure, which involves “division of labour, cooperation, preparatory work, technical assistance, mutual exchange of ideas and controversy”. He also discusses how thoughts are exchanged between individuals and become a “little transformed” each time.[119] In a later chapter in the book, Fleck refines the definition of thought style as “the readiness for directed perception, with corresponding mental and objective assimilation of what has been so perceived”.[120] According to Fleck, this thought style, because it belongs to a community, will undergo social reinforcement, and the community (i.e. the thought collective) may be transient or stable. Fleck further distinguishes the stable thought collective as having “structural characteristics” that can be thought of as a small esoteric circle and a large exoteric circle, each consisting of members belonging to the thought collective and “forming

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[118] Fleck, *Genesis and Development of a Scientific Fact,* pp 38-40.
[119] Fleck, *Genesis and Development of a Scientific Fact,* pp 41-42.
[120] Fleck, *Genesis and Development of a Scientific Fact,* p99.

around any work of the mind". A thought collective may have many intersecting circles, with individuals belonging to several of them at any one time. Fleck suggests that individuals may belong to several exoteric circles but fewer, if any, esoteric circles.[121]

Fleck then applies this to what he termed the "special structure of the thought collective of science".[122] He proposes that the esoteric circle would consist of the "specialised experts" but also "general experts". The exoteric circle would comprise the "educated amateurs". Fleck suggests that there were four socio-intellectual forms of knowledge that informed these groups: journal science for the specialised experts, handbook (vademecum) science for the general experts, popular science for the exoteric circle, and textbook science that allowed initiation into the esoteric circle (which implies that transfer between circles is possible). Operationally, there is a democratic exchange of ideas and experience emanating from the esoteric circle and communicated outwards to the exoteric circle, and then feedback to the esoteric circle. Eventually this results in a consolidation of ideas which emerge as scientific facts. Fleck also notes "every communication and indeed all nomenclature tends to make any item of knowledge more exoteric and popular". Fleck's editors (Trenn and Merton) suggest for Fleck that all empirical discovery can be understood as either a supplement, a development or a transformation of thought style with the greatest transformations occurring "during periods of general social confusion".[123] Fleck's work was not translated into English until the mid 1970s, and therefore effectively rediscovered by sociologists of science and medicine at this time.[124]

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[121] Fleck, *Genesis and Development of a Scientific Fact,* p105.
[122] Fleck, *Genesis and Development of a Scientific Fact*, pp 110 -112.
[123] Fleck, *Genesis and Development of a Scientific Fact,* p162.
[124] See for example I Lowy, "Introduction: Ludwick Fleck's Epistemology of Medicine and Biomedical Sciences", *Studies in History and Philosophy of Biological and Biomedical Sciences,* Volume 35, 2004, pp 437- 445 and Fleck, Genesis and Development of a Scientific Fact p163.

It was Thomas Kuhn's referral to Fleck's work that led to the latter's rediscovery and Kuhn promoted the view that Fleck's work was pioneering in terms of medical sociology. Thomas Kuhn acknowledged Fleck's work as "an essay that anticipates many of my own ideas".[125] The latest version of Kuhn's book, however, endorses the view that Kuhn's ideas about scientific communities and paradigms were analogous to Fleck's thought collectives and thought styles.[126] Fleck's theories on how scientific knowledge originates, especially the idea that it is an outcome of a thought collective process involving an esoteric (inner) core of specialists surrounded by an exoteric (outer core) of educated and uneducated lay persons, have been cited by sociologists explaining the construction of medical knowledge for occupational diseases.[127] The collective process establishes medical facts by the exchange and negotiation of ideas between the inner and outer core. Fleck was a practitioner, medical doctor and researcher and was thus able to develop his epistemological ideas around very practical questions from the empirical data relating to his laboratory work and also from his observation of the development of knowledge from the medical staff as an "internal participant" and "external observer".[128]

The Fleckian approach has been applied in a contemporary setting to a study of a musculoskeletal condition known as Repetitive Strain Injury (RSI) in the 1990s, in order to attempt a social construction of RSI in the UK.[129] Arksey applies Fleck's two prime analytical concepts of thought collectives and thought styles to her RSI study.[130] She proposes that whilst the purpose of thought collectives was a mutual exchange of ideas, there was a

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[125] See T Kuhn, in Fleck, *Genesis and Development of a Scientific Fact,* pp vii–xi and TS Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 50th Anniversary edition, 2012), p xli.
[126] See I Hacking, "Introductory Essay" in Kuhn, *The Structure of Scientific Revolutions,* pp xii.
[127] See Dembe, *Occupation and Disease, p* 3 and H Arksey, *RSI and the Experts, the Construction of Medical Knowledge* (London: UCL Press, 1998); pp 146-150.
[128] I Lowy, "Ludwick Fleck on the Social Construction of Medical Knowledge", *Sociology of Health and Illness,* Volume *2,* 2004, pp 131-151.
[129] H Arksey, "Expert and Lay Participation in the Construction of Medical Knowledge", *Sociology of Health and Illness,* Volume 16(4), 1994, pp 448-468.
[130] Arksey, "Expert and Lay Participation in the Construction of Medical Knowledge".

degree of scale within each collective so for example there might be a small central esoteric circle of very specialised experts surrounded by a larger circle of more general specialists. Similarly, an exoteric circle may operate on a scale from the "general public" to the "educated layman". Communication may be enhanced, and overlap may occur because of the gradations of scale within the two circles. Individuals in a thought collective are bound together through the mechanism of a shared thought style, although the style may not be apparent to the group members. Arksey concludes that only some of Fleck's theories could be supported in her RSI study. She reflects that the early writings on arm pain and cramp anticipate the present debate on work related musculoskeletal disorders, with a dualistic argument between physiological and psychological causation.[131] This would support Fleck's belief that modern scientific and medical knowledge would always be influenced by the past and that Fleck's "vademecum" (i.e. handbook) science is still relevant for RSI, given the amount of information freely available in the public domain (e.g. in non-research texts) about the condition as a proven disease entity.[132] Arksey suggests that in Fleck's time, exoteric circles were of minimal value as their role is to pass on consolidated information as passive intermediaries in a one way direction (i.e. no account is taken of patients passing knowledge back to doctors). She concludes that the optimum way to interpret the exoteric and esoteric circles was as a "series of states" which range from co-option to inactivity to relative hostility depending on the nature of the disease.

1.3.4 Application of Fleck's model to telegraphists' cramp

The theory and methodology of how historians and sociologists of scientific knowledge and medicine have approached and conceptualised the phenomenon described as disease is

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[131] H Arksey, *RSI and the Experts, the Construction of Medical Knowledge* (London: UCL Press, 1998), p 165.
[132] One example of this is a modern day registered charity which operates on behalf of those suffering from RSI. See http://www.rsiaction.org.uk/ last accessed 10/05/2019. See also the BT website http://home.bt.com/lifestyle/health/health-concerns/do-you-have-rsi-check-the-signs-and-symptoms-of-repetitive-strain-injury-11364034461597 last accessed 10/05/2019.

relevant to understanding how telegraphists' cramp was constructed and framed. The social construction of the disease can be analysed by examining workers with symptoms, and studying their interactions with medical practitioners, but in order to gain knowledge of an occupational disease scientific input is required. This may be gained by observation and empirical data collection in the workplace that is external to the clinical - medical domain of health professionals. Fleck's model of using thought collectives and thought styles provides a tool by which this wider community of actors can be analysed externally to the clinical-medical domain, whilst taking account of social and cultural factors. As Arksey comments:

> Fleck's approach is relativist; according to this position scientific beliefs or theories are seen as rooted in (or relative to) the place, age or society that produces them, and not valid outside those particular circumstances. Accordingly, for Fleck knowledge is socially and culturally conditioned as well as historically determined by links with the past.[133]

It is evident from the literature that there were different groups of actors involved throughout the life cycle of telegraphists' cramp and the use of a Fleckian approach will provide a methodology that will deal with the multiplicity of different actors, enable identification of the thought collectives, their thought styles and the communication and interrelationships between them. Furthermore, this will enable scrutiny of the sociopolitical relations of the different groups and networks that emerged and contested, and any conflicting cultures. For telegraphists' cramp, I argue that the thought collectives will include the workforce, trade unions, medical and scientific practitioners, employers, government and legal professionals. These collectives will contribute to and influence the negotiation and framing of the disease, examine the effects of compensation, law and financial redress on the development of telegraphists' cramp as an occupational disease. The identification of the thought collectives

[133] Arksey, *RSI and the Experts, the Construction of Medical Knowledge*, p 147.

(exoteric and esoteric) and their emerging thought styles, who may or may not modify views and behaviour, are a key part of the analysis. As Fleck suggests, thought collectives may have many intersecting circles, with individuals belonging to several of them concurrently.[134] Unlike Fleck's work at the time or the contemporary RSI study, it is likely to be more difficult to establish the thought styles and collectives as the methodology is reliant on interrogation of archive data rather than an ethnographic approach (as it is not possible to collect live subject observations or discussions). This approach will require careful interpretation and identification of the actor groups and networks, their formation and dynamics in order to map the esoteric and exoteric circles. It will be necessary to identify communication styles and mechanisms between the groups, and to understand how they developed and then used common terminology. It is important to understand whether consensus was reached within and between the groups on issues, for example the nature of cramp, and work practices that may result in cramp. An initial definition of key groups can be made based on the likelihood that they will include the workforce, trade unions, medical practitioners, employers and government, but these groups are likely to change with time, the emergence of new information about the disease and the involvement of further groups, for example the scientists of the Industrial Fatigue Research Board in the 1920s. This will be an interesting addition to mapping the Fleckian model, as neither Fleck's original work nor Arksey's RSI study considered the effects of the passage of time on the evolution of thought collectives and their thought styles. For the proposed research, Fleck's model facilitates scrutiny of historical data by analysis of the different groups, emerging and evolving thought styles and their interrelationships during the life cycle of the disease.

The Fleckian approach I have described above adds to and refocuses and complements traditional narrative approaches to the history of occupational diseases. It has enabled me to locate and direct my focus and analysis to account for the different perspectives on

[134] Fleck, *Genesis and Development of a Scientific Fact*, p 105.

telegraphists' cramp. These included the different historical actor groups and why they adopted different opinions in terms of social location and interest. Using this approach enabled me to both develop a historical sociology of knowledge of telegraphists' cramp and to undertake a systematic analysis of how the disease changed during its lifecycle. I reasoned this approach would complement the traditional narrative approach. Using the Fleckian methodology with a focus on key events in the history of the disease (e.g. successive enquiry committees) facilitated representation of how knowledge changed during the course of the disease from its emergence to disappearance. As well as constructing a social historical narrative, the use of modelling assisted in summarising and highlighting the key social and technological factors of how the knowledge about telegraphists' cramp changed with time. However, using a modelling approach does have limitations. In my research I was able to apply this approach to key events in the history of telegraphists' cramp - the investigating committees and the 1927 study of the disease. One limitation of using an event based focus could be that this excludes capturing the gradual changes in thoughts and views expressed by the networks of actors prior to the crystallisation of opinions and resulting decisions during and after the stages that identified for telegraphists' cramp. Associated with this is the potential loss of detail associated with these perhaps subtle changes that could be captured using a narrative approach. It was fortuitous for telegraphists' cramp that key stages in the life cycle of the disease could be identified. When considering historical analyses of other occupational diseases there may not be such clear cut stages that can be identified and this would be another limitation of adopting solely a modelling approach when compared to a narrative approach.

1.4 Aims and objectives of the telegraphists' cramp research study

My thesis has undertaken an historical, qualitative case study of telegraphists' cramp. Telegraphists' cramp has been paid little attention by social historians and references in occupational health history are scarce, possibly because by the 1930s the disease had disappeared from view. It was initially categorised with other occupationally related musculoskeletal diseases (for example milkmaids' cramp and lace makers' cramps) as a curiosity with little further information about causation, signs and symptoms apart from the label associating them to the particular trade or activity thought to precipitate the condition. I argue that telegraphists' cramp differs from these conditions for a number of reasons. Firstly, this was an occupational disease that affected a large number of people in the workforce in its lifetime which slowly emerged as the result of telegraph workers being exposed to new technology introduced in the workplace and work regimes and conditions imposed by their employer (the Post Office). This affected many of their employees. Secondly, the time of its development from 1875 onwards, coincided with a background of trade union development throughout the Post Office in response to pay, grades, and working conditions which achieved a high political profile. In parallel with this, theories were developing around the rapid increase in industrialisation and the effects of long working hours on workers' health and wellbeing. These theories related to the emerging concepts of modernity and to conditions such as nervousness and fatigue, whose development was attributed to the pace of an industrialised society.

To the best of my knowledge, recent histories of occupational disease do not include detailed histories of telegraphists' cramp or other occupational musculoskeletal diseases which examine the medical, political and scientific perspectives and the social networks involved. My telegraphists' cramp case study contributes significantly to the body of historical knowledge of occupational musculoskeletal disorders at the start of the twentieth century.

Previous research has demonstrated that the response to occupational disease in the workplace was intertwined with the social and political relations in the workplace as well as state intervention.[135] Whilst all these factors are highly relevant to telegraphists' cramp, the major difference is that other occupational diseases in the nineteenth and early twentieth centuries occurred in high hazard industries where the work was carried out by the working classes. By contrast, the telegraphists were civil servants employed by the government who worked in the Post Office with its hierarchical management structure. Being office based, their work and workplace was perceived as a safe environment, yet the telegraphists contracted a musculoskeletal occupational disease. My study of telegraphists' cramp thus provides an opportunity to understand how and why all these factors interacted in this time period resulting in a high profile occupational disease in the early twentieth century. It will contribute to the generation of history and knowledge of this condition and associated sociopolitical factors. Based on Fleckian principles, the creation of the mapping models for telegraphists' cramp can provide a methodology that synthesizes all the sociopolitical factors to account for the workers, management, and medical and scientific experts involved during the timeframe of the disease. This would also be a useful addition that historians of occupational health could use in future investigations of occupational disease.

1.4.1 The research questions

Another intriguing facet of the research is that other occupational diseases present at the time telegraphists' cramp emerged, were the result of workplace exposure to highly hazardous materials which produced quantifiable and often visibly dramatic clinical signs and symptoms. These have now completely disappeared, either because of the obsolescence of the specific industry or because of the introduction of environmental controls in the

[135] For example see, Bartrip, *The Home Office and the Dangerous Trades,* Harrison, *Not only the 'Dangerous Trades'*, and McIvor, *A History of Work in Britain.*

workplace.[136] Environmental controls as a means of controlling worker exposure are a fundamental tenet of modern day occupational health and their historical development is retrospectively celebrated by historians and current day occupational health professionals alike. I argue that the reason that telegraphists' cramp and other historical occupational musculoskeletal diseases have been neglected is because they do not fit with the current environmental control paradigm of modern occupational health. However, in the present day, musculoskeletal disorders continue to proliferate with the introduction of new and mobile technologies. Similar issues that affected the telegraphists are still being discussed today by the same networks of actors (i.e. the workers, employers, trade unions, medical and scientific professionals). Musculoskeletal ill health and disabling disease resulting from work still occurs, as evidenced by the large numbers of lost working days attributable to these conditions.[137] It is not known whether this is the result of the introduction of new technology into the workplace. However, one difference between telegraphists' cramp and present day musculoskeletal disorders relates to that of compensation for work related injury and disease. Telegraphists diagnosed with the disease qualified for compensation at a relatively early time point in the history of the disease.[138] In the present day, there is no defined legal process for compensation for many musculoskeletal disorders, individual employees have to pursue civil court claims against their employers.[139] It is necessary to understand the sociopolitical factors existing in the 1900s that led to compensation then but not in present times. I suggest that in the 1900s, closer relationships between politics, work and health were emerging. This is especially evident in the Post Office with the emerging power of the

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[136] As examples, phosphorus, mercury, lead - the chemicals and processes of the so called 'Dangerous Trades'.
[137] The UK Health and Safety Executive (HSE) report a total of 469,000 workers self-reporting musculoskeletal disorders, and of these 197,000 (42%) were in the upper limbs or neck, with a total of 2.6 million lost working days in 2017 to 2018. See the UK Health and Safety Executive (HSE) report "Work-Related Musculoskeletal disorder statistics (WRMSDs) in Great Britain, 2018". See http://www.hse.gov.uk/statistics/causdis/msd.pdf, last accessed 10/05/2019.
[138] There was a process of certification by Post Office Medical Officers that enabled this.
[139] See UK Health and Safety Executive (HSE) Research Report 010 "*How the Courts are Interpreting HSE Guidance and Health and Safety Regulations – An Exploratory Study of Court Judgements in Personal Injury claims for WRULDs"* (Norwich: HMSO, 2002), pp 1-30.

trade unions and their quest for improved employment conditions and the political (government appointed) post of the Postmaster General. The Post Office was a nationalised industry whose employees were civil servants; they introduced new technology (the telegraph) resulting in a new class of employee (office based telegraphists) and introduced a country wide network of Post Office Medical Officers to oversee their employees' health. Being accountable to government, they would want to be seen as an exemplary and modern employer.

The specific questions of my research are:

1. How did telegraphists' cramp emerge as an occupational disease, how was it framed as a disease entity and what were the medical classification issues?
2. How was telegraphists' cramp negotiated and contested as a compensatable occupational disease within the political structure in Britain between 1875 and 1930?
3. How did the framing of telegraphists' cramp change with the establishment of professional scientific bodies?
4. Can the disease be mapped as an occupational musculoskeletal disorder considering the changing medical, political and scientific definitions, and by using a Fleckian approach to map the social and sociopolitical networks involved?

I have constructed the research questions to enable the creation of the history of telegraphists' cramp from its first appearance within the context of late nineteenth century medical discourses relating to the understanding of musculoskeletal disease, to its disappearance in the early 1930s, against the political and industrial relations background in Britain. Telegraphists' cramp was a disease reported extensively and exclusively by the

telegraphists within the Post Office. The reason for this is that they were the sole provider of telegraph services, having nationalised regional telegraph companies in 1868.[140]

1.5 Sources and methods

Using primary source archive materials, I have undertaken a text based study that provides a qualitative analysis of documents and texts to enable a historical account of the emergence, increase and disappearance of telegraphists' cramp between the late nineteenth century and the early 1930s. To fulfil one of my research aims, (specifically research question 4) I have generated a two strand social-historical model of telegraphists' cramp that could be used to explain the history of the disease during its lifecycle. Firstly, I propose that the framing and definition of telegraphists' cramp altered in response to changing medical, political and scientific arguments, therefore enabling the creation of a mapping model of the disease to account for the sociopolitical climate and, individual and organisational responses to the disease. Secondly, I propose the creation of a mapping model based on the work of Ludwick Fleck and his concepts of communities of thought collectives and their structural composition of esoteric groups ('specialised' and 'generalised' experts) and exoteric groups (lay persons). I have used Fleck's model to explain the different groups of experts and lay persons and how they interacted throughout the duration of telegraphists' cramp, but have also extended Fleck's model to provide an account of the evolving dynamics and social interactions between the experts and lay person groups that occurred over the lifecycle of the disease.

The Post Office in Britain was the major (state) employer of telegraphists after the enactment of the 1868 Telegraph Act, when telegraphists formerly employed privately by regional companies became civil servants and thus part of the state. I anticipated that as a

[140] For an account of nationlisation of the telegraph in Britain see Kieve, *Electric Telegraph A Social and Economic History,* pp 138-153.

government organisation there would be an archive of documents and the few references to telegraphists' cramp I found in at early stage in my research suggested the existence of such an entity. Specifically, as telegraphy was part of communications networks in Britain, it was logical to look at British Telecom (BT) sources. I found records from the BT website archive, which was undergoing a digitisation project being undertaken by the Coventry University with BT at the start of my research.[141] This has been of huge benefit to my research, although online availability of the digital archive was a constant issue in the early days of the project and my research. I found four main folders and these had a total of sixty one subfolders of archive documents specifically relating to telegraphists' cramp which provided evidence of internal Post Office communications, e.g. memoranda between Post Office medical staff, surveys, inventories of staff reporting muscle problems in regional telegraph offices, and correspondence between Post Officials and state ministers in the Home Office discussing issues surrounding compensation.[142] I also used the BT Archive in Holborn London to access the hardcopy versions of the folders and other relevant documents which were not available online.

Government legislation was an important aspect when discussing telegraphists' cramp in terms of scheduling of the disease for compensation and online access to Parliamentary Papers provided details of this and related factory and industrial legislation. Related government documents such as compensation enquiry reports, medical reports carried out on behalf of the Government for assessing compensation, and the general and trade specific reports of the government scientific research boards provided information to enable establishment of the identity and contestation of telegraphists' cramp.[143] Source documents

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[141] See the BT Digital archive, http://www.digitalarchives.bt.com/CalmView/Default.aspx? last accessed 10/05/2019.

[142] See POST 30/3399 (June 1907 to April 1909), POST 30/3400 (March 1909 to April 1912), POST 30/3401 (March 1912 to March 1914), and POST 30/3402 (March 1914 to June 1935), London: BT Archive.

[143] These documents were available through the online parliamentary papers database accessed through the University of Edinburgh Library and printed as pdf documents.

relating to trade unions, their structure and function within the Post Office were a valuable source of information to ascertain the sociopolitical relations within the Post Office during the lifecycle of telegraphists' cramp. The most active trade union during the contestation of telegraphists' cramp was the Postal Telegraph Clerks Association (PTCA), established in 1881 and most of their correspondence, meeting minute books and copies of their house journals were available for consultation at the Modern Records Centre, University of Warwick.[144] The Royal Mail Archive in London was also used to determine the staffing structures and management hierarchies, particularly for the Postmaster General's office, Head Office and the Central Telegraph Office (CTO) which were all located in London.[145]

Information concerning the medical profession's recognition and framing of the disease and its chronological progression was researched using British medical journals – *The Lancet* and *The British Medical Journal*.[146] An initial search of the online archives using search terms "telegraphists", "telegraphers", "telegraph workers", and "telegraphy" produced a large number of results. I found a range of reports for example the first publicised incidence of telegraphists' cramp in 1875 reported from Paris; the first medical reports of telegraphists' cramp in Britain from a Post Office Medical Officer (Edmund Robinson) in 1882, *The Lancet* reports from 1912, which over three successive weeks, included extracts from the Report of the Department Committee on Telegraphists' Cramp 1911. Later editions of both medical journals focused on reports of the Industrial Fatigue Research Board and the National Institute of Industrial Psychology as an indicator of the shifting emphasis and medical interest in occupational health and workplace psychology in the 1930s.

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[144] See https://warwick.ac.uk/services/library/mrc/, last accessed 10/05/2019. The website has a searchable catalogue, enabling relevant file identification prior to visiting.

[145] This is now part of the Postal Museum. See https://www.postalmuseum.org/discover/collections/archive-collection/, last accessed 10/05/2019.

[146] These journals were available online through *The Lancet* and *The British Medical Journal* archive databases, accessed through the University of Edinburgh Library and downloaded and printed as pdf documents.

One of the main limitations of my research related to using archive materials to analyse the history of telegraphists' cramp. I have extensively used the BT Archives to examine the Post Office response to the disease and the interactions with the telegraphist population. Many of the documents are focused on communications between Post Office Head Office management and the Central Telegraph Office (CTO), both based in London. There is little correspondence from the provincial Post Offices apart from Head Office and the Postal Telegraph Clerk Association (PTCA) discussion concerning individual cases of telegraphists' cramp. I therefore assumed that since the CTO employed the largest concentration of telegraphists in one location and highest levels of telegraph traffic, that they were a highly representative sample of telegraphists in Britain at the time of the disease. It is evident that the BT archives are not wholly complete, in some of the correspondence letters and memoranda referred to are missing. Some of the documents are written in very faint hand and typewriting and have been difficult to decipher. Others are torn at the edges so are incomplete in content. Another element which surprised me with the archive correspondence was the informality used in communications between Post Office staff. Many of the documents are either signed with the first name only, or simply initialled, leading to difficulties in decoding the senders, recipients and their work roles. Fortunately, the Post Office yearbooks available from the Royal Mail Archive (now the Postal Museum) were extremely helpful for identifying staff identities and job roles.[147] Similar problems were discovered with the trade union records from the Modern Records Centre at the University of Warwick. Whilst many of the PTCA documents are available, as with BT there are gaps in the archive history.

[147] These are staff directories that were issued annually by the Post Office and which detail each member of staff, their job role and work department.

1.6 Synopsis

In Chapters 2 and 3, I examine the pre-history of telegraphists' cramp in the late nineteenth century. The term occupational neurosis was devised by doctors to define repetitive hand and wrist movements used in a work context. Chapter 2 traces this development particularly in the context of writers' cramp, set against the background of fatigue and neurasthenia, conditions which doctors perceived were the result of a response to the pace of modern life and the rapid rise of industry and technology. It also examines the early treatment regimes for these diseases using electricity and physiological experiments carried out on telegraphists working in Edinburgh. Chapter 3, whilst it reviews the sporadic nature of telegraphists' cramp occurrences, also explores the rise of the trade unions within the Post Office. At this stage in the lifecycle of telegraphists' cramp, although there was peer to peer and lay knowledge developing among the medical practitioners and telegraphists, I conclude that there was not enough evidence about the disease to formulate models.

In Chapters 4 and 5, I evaluate the committees set up to investigate the increasing prevalence of telegraphists' cramp within the Post Office. Chapter 4 discusses the government Department Committee on Compensation for Industrial Diseases hearing (1908) and Chapter 5 the internal, but high profile, Department Committee on Telegraphists' Cramp (1911).[148] The terms of reference for the two committees differed markedly. The 1908 hearing was government led as part of a wider remit to examine compensation for the ill health of workers resulting from industrial diseases, where the major arguments focused on the existence of telegraphists' cramp and whether those injured from using the Morse key should be compensated. Evidence was heard on one day only, from medical doctors (the

[148] See the *Second Report of the Departmental Committee on Compensation for Industrial Diseases 1908*, Minutes of Evidence and Appendix (London: His Majesty's Stationary Office 1908) and the *Report on the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery Office, 1911).

Post Office deputy Medical officer Dr John Sinclair and a trade union appointed doctor, Dr Hale-White) and trade unions (PTCA) representatives. The 1911 committee, by comparison, had terms of reference set by Herbert Samuel the Postmaster General, who recognised telegraphists' cramp as an industrial disease from the start. There was a cross-disciplinary panel comprising Post Office experts who worked collaboratively, and which lasted eighteen months to enable a thorough examination of all aspects of the disease, use of the Morse key and the working environment of the telegraphists.[149] My analysis of the two committees enables me to generate two strand social-historical models of telegraphists' cramp that could be used to explain the history of the disease during its lifecycle.

Chapter 6 discusses the disappearance of telegraphists' cramp in the time period between 1915 and 1930. Occupational health reform in the workplace had developed to some extent as a result of the Liberal government welfare reforms of 1906 to 1914 and later, government recognition of the issue of WW1 productivity and efficiency when addressing health problems in the workplace. Understanding of how humans interacted with their work environment changed radically with the involvement of work science research boards and their growing interest in workplace psychology. Work scientists undertook studies in the workplace that focused on the interaction between workers and their work environment and added to an understanding of work related illness. A major part of Chapter 6 focuses on a scientific investigation of telegraphists' cramp published in 1927 by the IFRB.[150] The Post Office study concluded that the disease was an occupational neurosis, but one that was related to the psychoneurotic state of the individual telegraphist. This conclusion changed the perception of the disease from that of a physiological workplace environmental entity with the potential to affect the whole telegraphist population to one that focussed heavily on the psychological

[149] Sir Herbert Samuel had previously chaired the panel for the Departmental Committee on Compensation for Industrial Diseases, so had heard the medical evidence for telegraphists' cramp.
[150] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' Cramp", *Industrial Fatigue Research Board,* Report 43, 1927, pp IV-48. (London: His Majesty's Stationery Office, 1927).

status of the individual. From this I propose that the modelling of telegraphists' cramp became reframed in the 1920s, based on the conclusion that it was the result of the psychoneurotic state of the individual. This enables me to create a third stage of my two stranded model.

The discussion (Chapter 7), reviews the lifecycle of telegraphists' cramp from its first emergence until its disappearance and against this I justify my arguments for framing telegraphists' cramp as an occupational disease. I argue that the framing and definition of telegraphists' cramp altered in response to changing medical, political and scientific arguments and this is shown in my social-historical mapping model which maps the disease as two strands each of three stages. The first strand maps the sociopolitical climate and individual and organisational responses to the disease. The second strand is based on the work of Ludwick Fleck and his concepts of communities of thought collectives and their structural composition of esoteric groups ('specialised' and 'generalised' experts) and exoteric groups (lay persons). I propose that this model can be used to explain the different groups of experts and lay persons and how they interacted throughout the duration of telegraphists' cramp. I have also extended Fleck's model to provide an account of the changed dynamics and social interactions between the experts and lay person groups that occurred over the lifecycle of the disease. I argue that the telegraphists' cramp case study and the creation of the mapping models contributes significantly to the body of historical knowledge of occupational musculoskeletal disorders at the start of the twentieth century. The mapping models also provide a methodology that historians could use in future investigations of occupational diseases.

2 Occupational Neuroses

"Occupational neuroses", a term applied to repetitive hand and wrist movements performed in the context of work, was first identified as a label in the late 1880s, some years after writers' and telegraphists' cramp were first labelled as conditions associated with work. This was considered an "umbrella" definition which, as well as including writers' and telegraphists' cramp, was extended to other musculoskeletal disorders and visual disorders contracted during the course of employment.[151] Contemporaneously with this, new theories emerged about the effects of rapid industrialisation and changes in the pace of life as the result of new discoveries and mechanisation of society, for example, through the emergence of railways, electricity and steam power. These effects would be manifested as new medicalised concepts, theories and diseases such as those of fatigue and neurasthenia. Although in much of the literature, historians and medical sociologists, have viewed occupational neuroses and diseases of "modernity" (fatigue and neurasthenia) as separate discourses, my examination of archive materials suggests that medical practitioners at the time viewed them as overlapping constructs such that work and the pace of modern life would contribute to the manifestation of muscle and fatigue symptoms.

The aim of this chapter is to examine occupational neuroses: writers' cramp and the first identified cases of telegraphists' cramp. More cases were documented for writers' cramp than telegraphists' cramp in the second half of the nineteenth century. Knowledge and experience gained by medical professionals in theorising, diagnosing and treating writers' cramp, were later used as tools for telegraphists' cramp, in terms of medical diagnosis, treatment, and the actors involved (both professional and lay). In the late 1880s, both conditions were identified within a broader category: occupational neuroses, recognised to

[151] The visual disorder was miners' nystagmus which affected many coal miners in Britain.

be related to work tasks and requirements. Whilst writer's cramp provides a good lens through which to view telegraphists' cramp, I propose that this cannot be evaluated in isolation of other developments in medical thinking at this time. In the conclusion of the chapter I examine the relationships between writers' cramp and telegraphists' cramp. They were framed within the broader term "occupational neurosis" but evidence suggests that medical practitioners viewed them as variable manifestations of the same condition affecting the hands fingers and forearms. I also provide a short account of the medical thinking surrounding predisposition to and acquisition of disease as predisposition to telegraphists' cramp was an argument raised by the Post Office in the context of the compensation question.

2.1 Emergence of occupational neuroses

Some years before the nationalisation of the telegraph network and employment of large numbers of telegraphists, other professions were developing driven by industrial progress and commerce within Britain. Increasing numbers of staff were employed in administration roles as clerks, scribes, copywriters and bookkeepers to support the complexity of businesses such as banks and insurance companies.[152] With the repetitive nature and long duration of the required clerical work, reports started to appear in medical journals of clerks and businessmen reporting symptoms such as hand and finger pain and muscular cramps. Medical professionals assigned the diagnosis and label as that of scriveners' palsy or writers' cramp (I found these terms appear to have been used interchangeably), although much like the early days of telegraphists' cramp the first reports of writers' cramp suggested this was a

[152] Samuel Solly notes "the greatest part of the middle classes of London get their bread by the use of the pen". See *The Lancet,* 1864, Volume 84 (2156) pp 709-711.

"rare disease".[153] However, writers' cramp had been recognised before the nineteenth century. More than one hundred years previously, Bernardino Ramazzini (an Italian physician) had postulated a link between long hours spent writing and symptoms of hand and arm pain among scribes and notaries.[154]

The term "occupational neurosis" is attributed to Gowers who published several editions of theory and knowledge about the nervous system between 1886 and 1888.[155] In volume one of the first edition, he wrote several pages which introduced palsies of nerves of the arm and discussed the difficulties of diagnosis of "functional disorders" of the arm and the problems of distinguishing between neuralgia and neuritis. Gowers proposed that:

> the distinction rests on the variable and intermittent character of the initial pain, on the secondary character of nerve tenderness and absence of interference with the function of their fibres. A similar difficulty is presented by some cases of "occupation neurosis" of which "writers' cramp" is the most common form.

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[153] Samuel Solly at St Thomas's London gave a series of three lectures on Scriveners' Palsy which were published in the *Lancet*. See "Scriveners' Palsy or the Paralysis of Writers, Lecture I", *The Lancet,* 1864, Volume 84 (2156) pp 709-711*,* "Lectures on Scriveners' Palsy, Lecture II" *The Lancet,* 1865, Volume 85 (2161) pp 84-86*,* and "Lectures on Scriveners' Palsy, Lecture III" *The Lancet,* 1865, Volume (2162) pp 113-115. Solly qualified as a surgeon and worked at St Thomas's hospital initially as a lecturer in anatomy and physiology, then as a surgeon and lecturer in clinical surgery. In 1836 he published his major work on the human brain and nervous system. See the Oxford Dictionary of National Biography for further details, retrieved from http://www.oxforddnb.com/view/article/25989, last accessed 10/05/2019.

[154] See Bartrip, *The Home Office and the Dangerous Trades: Regulating Occupational Disease in Victorian and Edwardian Britain,* pp 12-14 and Dembe, *Occupation and Disease,* p 27.

[155] Gowers was a physician and lecturer at University College Hospital London. He specialised in diseases of the nervous system. His text book on the nervous system, became known as the 'bible of neurology'. See the Oxford Dictionary of National Biography for further details, retrieved from http://www.oxforddnb.com/view/article/33498, last accessed 10/05/2019.

See WR Gowers, *A Manual of Diseases of the Nervous System Volume 1* (London: J & A Churchill, 1886), p79 and also V*olume 2* (London: J & A Churchill, 1888), pp 656-676.

Gowers proposed that sensory symptoms (pain and tenderness) predominated over motor symptoms, that pain was exacerbated by only one kind of muscular effort (e.g. writing) and the absence of any actual paralysis (motor or sensory) "usually suffices for diagnosis".
I suggest that the term occupational neurosis thus provides a useful overarching definition to include both writers' and telegraphists' cramps as conditions affecting professional occupations in the second half of the nineteenth century, although the medical professionals did not use this label prior to Gowers' published work. Apart from the medical aspects, other features of the two conditions diverge markedly, for example in terms of employment (private versus public sector employees), trade unionism and later telegraphists' cramp gaining compensatable status, which writers' cramp never achieved in the early twentieth century.

Gowers focused his definition and terminology of occupational neuroses on musculoskeletal disorders, but the term was also used later to define a visual condition affecting coal miners which became labelled as miners' nystagmus by ophthalmology doctors. In 1875 and a few months after the Onimus report of telegraphists' cramp a report appeared in *The Lancet* entitled "Observations on miners' nystagmus – a new disease".[156] Charles Bell Taylor reported that he had seen several cases of a "comparatively new or hitherto unstudied affection". He named this "miners' nystagmus" from the "peculiar oscillating motions of the eyeball" and said he had only observed it occurring in "the men employed in the coal pits of this and the neighbouring counties". Bell Taylor attributed this condition to fixation of the eyes especially in a stooping posture, claiming that it occurred in healthy individuals and that it was curable. He proposed the physiological basis was alternating contractions of the eye recti and oblique muscles resulting in horizontal or rotational oscillations of the eyes. At an early stage in the report, Bell Taylor suggested that miners' nystagmus was analogous to both writers' cramp and telegraphists' cramp and emphasised the work relatedness of the

[156] See Charles Bell Taylor, "Miners' Nystagmus", *The Lancet,* 1875, Volume 105 (2702) pp 821-822. Bell Taylor was a surgeon to the Nottingham and Midland Eye Infirmary.

condition by a discussion of the poor lighting conditions miners experienced underground and also recognition that change of occupation could effect a cure. Another aspect that Bell Taylor raised, not considered by subsequent reports at this time, was that miners perceived the condition to be the result of accidents at work, and that this perception might be relevant from a medico-legal point of view i.e. compensation related. He concluded that miners' nystagmus was a new disease, although amenable to treatment.

This report provoked interest among physicians and surgeons working in the coal mining areas of Britain and stimulated the regular publication of articles about miners' nystagmus in the medical journals, in sharp contrast to the medical interest shown in telegraphists' cramp during this time period.[157] This was possibly because in the second half of the nineteenth century, coal mining was a well-established and government regulated industry that had introduced health and safety requirements, set up a mines inspection system and used local medical practitioners in the role of mine doctors.[158] Much like writers' cramp, there was a proposal that miners' nystagmus symptoms suggested some central nervous system change and a suggestion that the name should be miners' neurosis, based on lack of objective symptoms on examination.[159] Although there was general consensus on the environmental factors that promoted the onset of miners' nystagmus, there was much debate about its physiological origin.[160] I suggest that some consensus on miners' nystagmus appeared in the

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[157] One major correspondent was Dr Simeon Snell, a surgeon at the Sheffield Eye Dispensary See for example, Simeon Snell, "Miners' Nystagmus", *The Lancet*, 1875, Volume 106 (2706) p 81. Dr Snell would later assume the role of expert on miners' nystagmus when the disease became compensatable in 1907.

[158] By 1860, three Mines acts had been passed by the government and a mines inspection system: the HM Mines Inspectorate put in place. See Bartrip, *The Home Office and the Dangerous Trades: Regulating Occupational Disease in Victorian and Edwardian Britain,* p 61 and p 71 and OP Edmonds and EL Edmonds, "An Account of the Founding of HM Inspectorate of Mines and the Work of the First Inspector Hugh Seymour Tremenheere", *British Journal of Industrial Medicine*, 1963, Volume 20 pp 210 – 217.

[159] This originated from a lecture delivered by a Dr CS Jeaffreson, a senior surgeon in Newcastle. See CS Jeaffreson, "Abstract of a Clinical Lecture on Miners' Nystagmus," *The British Medical Journal*, 1887, Volume 2 (1385) pp 109-111.

[160] See S Snell, "Miners' Nystagmus", *The British Medical Journal*, 1887, Volume 2 (1386) p 218 and responses by CS Jeaffreson, "Miners' Nystagmus", *The British Medical Journal*, 1887, Volume 2 (1389), p 380, and further responses from Snell, "Miners' Nystagmus", *The British Medical Journal*, 1887, Volume 2 (1390), p 434 and the

last decade of the nineteenth century. *The British Medical Journal* published a series of linked papers, presumably from a meeting, from a group of ophthalmic physicians and surgeons who were based in some of the coal mining regions of Britain (South Wales, Yorkshire and Durham).[161] The overall conclusion was that insufficient light and excessive muscular exertion were implicated in the causation of miners' nystagmus and that it was unwise to minimise the importance of either, but that there was a need to gather empirical data to verify the case histories observed. The early history of miners' nystagmus becomes relevant to telegraphists' cramp, because at a relatively early stage of the disease, the medical profession accepted it as a work-related disease.

2.2 Modernity, fatigue, neurasthenia and occupational neuroses

In the late nineteenth century and originating in Europe, the concept of modernity was recognised in parallel with the rise in industrialisation and greater numbers of people being in paid employment working regular but long hours. Industrialisation was also linked to views appearing of the human body as part of a larger man-machine environment. The writings of scientists, philosophers and social commentators represent consensus of psychological and physiological views about aspects of the human body being subjected to the stresses and strains of an industrial society. Human fatigue was identified as one consequence of modernity.[162] Killen, in the context of developments in Berlin during this time period argued that the result of modernisation was the emergence of the "nervous self" with increasing industrialisation and that "to be modern meant to be nervous".[163] The root cause of this was

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earlier letter by Snell, "Miners' (Colliers') Nystagmus", *The British Medical Journal*, 1884, Volume (1233), p 343.

[161] See JH Bell, WT Cocking, J Court, H Bendelack-Hewetson, S Snell, J Tatum Thompson and Priestly Smith, "A Discussion on Miners' Nystagmus", *The British Medical Journal*, 1892, Volume 2 (1659), pp 834-840.

[162] See Rabinbach, *The Human Motor,* pp 84-88 for further discussion on modernity and pp 19-44 for a general discussion on the "discovery" of fatigue in society in the 1870s.

[163] See Andreas Killen, *Berlin Electropolis: Shock, Nerves and German Modernity* (Los Angeles: University of California Press 2006).

living in a “fast world” saturated with “new stimuli, demands, risks, messages and pleasures, requiring constant adaptation to a wealth of new experiences” and linked to developments in electrical technology according to Killen.[164] These developments were experienced first in America and then in Britain and, as time progressed resulted in the social construction and framing of a new disease – neurasthenia, as a manifestation of mental and physical fatigue. Medical opinion and knowledge of fatigue and neurasthenia became relevant to workers suffering from occupational neuroses from the 1870s onwards, who would also be living in “modernity” and in the case of telegraphists, using new technology. I have therefore included a brief summary of medical thinking about fatigue and neurasthenia in the context of how this may have influenced diagnosis and treatment of workers with writers’ and telegraphists’ cramps.[165]

As Rabinbach comments, the concept of fatigue did not appear in the medical literature prior to 1870.[166] In 1875, Poore published a paper entitled “On Fatigue”.[167] This was in response to an earlier series of articles published in *The Lancet* which discussed overwork and nervous and anxiety disorders.[168] Rather than proliferate the use of the term “overwork”, Poore skilfully introduced the term “fatigue” as a consequence of work at the start of the article, “work results in fatigue and fatigue is a regular and constantly returning symptom experienced by all of us”. He then defined two classes of fatigue, “general” and “local” with a

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[164] See Killen, *Berlin Electropolis,* Introduction.
[165] Although the first cases of writers’ cramp were diagnosed prior to 1870.
[166] See Rabinbach, *The Human Motor,* p 38.
[167] See GV Poore, “On Fatigue”, *The Lancet*, 1875, Volume106 (2709) pp163-164. Poore trained at University College Hospital London qualifying in 1866 as a physician. He became lecturer in medical jurisprudence at Charing Cross Hospital in 1872. He published the first textbook on the use of electricity in medicine and surgery in 1876 and later became a professor at Charing Cross (1883). He published papers on a diverse range of medical subjects from nervous diseases of the hand, to hand mouth and nose diseases. See the Oxford Dictionary of National Biography for further details, retrieved from http://www.oxforddnb.com/view/article/35571, last accessed 10/05/2019.
[168] See S Wilks, “On Overwork”, *The Lancet*, 1875, Volume 106 (2705) pp 886-887, G Johnson, “Lectures on some Nervous Disorders that Rresult from Overwork and Mental Anxiety”, *The Lancet*, 1875, Volume106 (2707) pp 85-87, and G Savage “ Overwork as a Cause of Insanity”, *The Lancet*, 1875, Volume 106 (2708) pp 85-87. See also a similar article by F MacCabe, “On Mental Strain and Overwork”, *The British Journal of Psychiatry*, 1875, Volume 21, pp 388-402.

further distinction that both could be “acute” or “chronic”. General fatigue was reasoned to be “a disability from performing either physical or mental work” and could be “acute” or “chronic”, affecting “the brain and the nervous system”. Poore’s identification of acute local fatigue was specific and recognised key symptoms that would later be used in the diagnosis of occupational neuroses i.e. loss of power, tremor, cramp-like muscle contractions, and pain, with all of these being the result of excessive and sustained muscular effort, although he argued that sustained effort was a more “potent cause” of fatigue than repeated effort. He cited writers’ cramp and hammer palsy as examples of (medical) conditions that were the outcomes of chronic local fatigue. Poore focused on the symptoms of physical fatigue but acknowledged that mental anxiety was linked to an overstrain of the nervous system brought on by overwork and the high pressure of life, thus reaching agreement with the articles published by Wilks and Johnson.[169]

Prior to 1875, America was dealing with the anxieties imposed by fatigue resulting from pressure of work and living in the modern world through the lens of the newly created disease neurasthenia. Much has been written by historians of medicine on the subject of neurasthenia.[170] The definition and name originate from a New York neurologist, George Beard in 1869.[171] Beard proposed that “lack of nervous energy” resulted in a wide range of physical and mental symptoms including anxiety, despair, extreme fatigue and indigestion. This was an American disorder Beard rationalised, affecting the middle and upper classes of society (including intellectuals and professionals) as a result of industrialisation, for example,

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[169]S Wilks, “On Overwork”, *The Lancet*, 1875, Volume 106 (2705) pp 886-887, G Johnson, “Lectures on some Nervous disorders that Result from Overwork and Mental Anxiety”, *The Lancet*, 1875, Volume106 (2707) pp 85-87.

[170] See for example the collection of papers in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001).

[171] For accounts of George Beard and the framing of neurasthenia, see B Sicherman, “The Uses of a Diagnosis: Doctors, Patients and Neurasthenia”, *Journal of the History of Medicine and Allied Sciences,* 1977, Volume 32 (1): pp 33-54.D Schuster, “Personalising Illness and Modernity: S. Weir Mitchell, Literary Women and Neurasthenia, 1870-1914”, *Bulletin of the History of Medicine,* 2005, Volume 79 (4) pp 695-722 and R Porter, “Nervousness, Eighteen and Nineteenth Century Style” in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia,* pp 31-51.

the emergence of steam power, the telegraph, railways, and the pace of modern life, the impact of which could result in additional strain and the symptoms of neurasthenia. In reality though, I argue that neurasthenia was a fashionable label for mental and physical fatigue. Gender was perceived to influence the onset of neurasthenia, affecting men through working in business and industry but women through overwork and caring in the home or even excessive socialising. In some countries, physicians diagnosed women with similar symptoms to neurasthenia as suffering from hysteria.[172] Following diagnosis, treatment regimes were recommended by medical practitioners. In America a polymath doctor, Dr Silas Weir Mitchell promoted a cure.[173] He concurred with Beard's interpretation that neurasthenia was a condition resulting from modernity. His treatment solution was the "rest cure", consisting of a fat rich diet to encourage weight gain, six to eight weeks bed rest and electricity and massage to counteract muscle atrophy.[174] The purpose of this was to gain replenishing energy supplies for the body. Most of Weir-Mitchell's patients were females and he treated some high-profile female writers in America. The cure operated on two levels, dietary based (to replenish energy supplies) and psychologically to strengthen minds, often by suggesting creative and intellectual activities. Mitchell himself was a neurasthenic, so I suggest that he identified with these patients who probably also wanted attention and sympathy. Most of his detailed accounts of the rest cure concerns the females he treated.[175]

America had been dealing, through the perspective of neurasthenia, with the anxieties imposed by fatigue resulting from pressure of society and living in the modern world. However, neurasthenia was a much less acclaimed illness in Britain. Porter suggests that

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[172] Poirier and Slijkhuis discuss gender differences. Poirier focuses on this as part of discussion on the Weir Mitchell rest cure; Slijkhuis examines the condition in the Netherlands in 1900. See S Poirier, "The Weir Mitchell Rest Cure: Doctors and Patients", *Women's Studies,* 1983, Vol 10, pp 15-40 and J Slijkhuis, "Neurasthenia as Pandora's Box?" in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia*, pp 257-279.

[173] Schuster suggests that Weir Mitchell became "an influential shaper of neurasthenia in the late nineteenth century". See Schuster, "Personalising Illness and Modernity".

[174] See Schuster and Poirier for details of the rest cure.

[175] Schuster describes three literary women in America that Mitchell treated. Poirier suggests that he cured overwhelming numbers of women and became somewhat of a celebrity doctor.

when it crossed the Atlantic from America it received a “mixed response”, despite it providing a label to classify and frame nervous disorders.[176] This is supported by few published reports in the British medical journals (*The Lancet* and *The British Medical Journal*) in the period prior to 1900 although some appeared in the first decade of the twentieth century.[177] By contrast, there were in excess of one hundred reports and articles published in American journals such as the *Journal of the Medical Association of America* and the *Journal of Mental and Nervous Diseases.* Two distinguished British physicians, Clifford Allbutt and William Playfair were supportive of neurasthenia as a disease arising from females with gynecological issues.[178] Playfair initially embraced Weir Mitchell’s rest cure, although in 1888, published a paper presenting limitations to its use.[179] The prevalence of neurasthenia among the upper classes (in America) made it a socially acceptable illness and in Britain the same phenomenon was observed.[180] The fact that it was deemed a somatic nervous disease, also helped to raise its respectability for wealthy patients and their physicians. Some British physicians used a broad spectrum of treatments to demonstrate their expertise by a combination of therapies: diet, medication and rest cures, not unlike Weir Mitchell in America.[181] One of the most important features of neurasthenia (whether in Britain or America) was that it was a highly individual illness that could personalise the doctor-patient relationship by a tailored diagnosis and treatment regime. Such treatments would inevitably

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[176] See Porter, “Nervousness, Eighteen and Nineteenth Century Style” and Sicherman “The Uses of a Diagnosis: Doctors, Patients and Neurasthenia”.

[177] See for example, J Matthews Duncan “Clinical Lecture on Hysteria, Neurasthenia and Anorexia Nervosa”, *The Lancet*, 1889, Volume 133 (3429) pp 973 to 974, and a commentary “Neurasthenia”, *The Lancet,* 1904, Volume 163 (4209), p1220.

[178] For an account of this see H Marland, “Uterine Mischief? WS Playfair and his Neurasthenic Patients”, in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia,* pp 117 -141.

[179] See WS Playfair, “On the Limitations of the so-called “Weir-Mitchell treatment”, *The Lancet,* 1888, Volume 131, (3358) pp 88-89.

[180] See Schuster and also C Sengoopta, “A Mob of Incoherent Symptoms? Neurasthenia in British Medical Discourse, 1860–1920”, in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia,* pp 91-117.

[181] M Thomson, “Neurasthenia in Britain: An Overview” in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia,* pp 77-97.

be more accessible to the wealthy classes, perpetuating the idea that neurasthenia was a socially engineered, middle- and upper-class disease.[182]

The important argument that I would make from this summary review of fatigue and neurasthenia is how much influence these factors had on the framing and diagnosis of occupational neuroses such as writers' and telegraphists' cramp. There are certainly apparent gender differences observed when treatment methods for these conditions are reviewed.[183] Treatments administered tended to be personalised for the individual and, similarly to neurasthenia, this becomes evident from the individual case histories reported by medical practitioners for both writers' and telegraphists' cramp. Neurasthenia was identified as a "centralised" nervous condition affecting the whole body, with fatigue being just one symptom of the illness. In the 1880s, Poore and Gowers identified the role of fatigue, but also hours worked and repetitive movements as key factors in the development of occupational neuroses but did not suggest this resulted in neurasthenia. Thus, they identified two more new contributing factors (duration and repetition of work) to fatigue, all three having roots in industrialisation, and modernity.

2.2.1 Predisposition to and acquisition of disease

Individual predisposition to telegraphists' cramp was raised as a relevant factor to the probability of developing the disease by Post Office management and the Chief Medical Officer (Dr A Wilson), in the discussions surrounding whether the disease should be scheduled for compensation. In the late nineteenth-century and early twentieth century there was notable discussion among doctors about the relative contribution of hereditary predisposition to disease incidence, and telegraphists' cramp would have been questioned

[182] Schuster discusses the concept of personalised suffering.
[183] For example Edmund Robinson's description of treatments he prescribed for telegraphists' cramp. See "Cases of Telegraphists' Cramp", *The British Medical Journal* 1882, Volume 2 (1140) pp 880.

by observers in the same way. I am using tuberculosis as a representative example to discuss the thinking and discussion about heredity and disease pathogenicity that were occurring during this time period.

In late nineteenth-century medicine there was a range of opinion held by doctors on disease causation. Rosenberg suggests that four presumptions concerning heredity were held among doctors.[184] These were: (1) that acquired characteristics could be inherited from parents; (2) that heredity was a dynamic process that changed through foetal development and babyhood; (3) that predisposition to character, temperament, and disease could be framed as diathesis (constitutional weakness); (4) that males and females assume different roles in the process of heredity. Rosenberg argues that these four criteria remained largely unchallenged during the nineteenth-century and influenced medical perceptions of chronic and constitutional diseases such as tuberculosis, cancer, and heart disease which were related to individual temperament and resistance.[185] Bynum suggests that diathesis originated from Darwinian evolutionary theory. Therefore, if a person developed a specific disease (such as tuberculosis) as well as their parents, this would in a doctor's eyes, prove the constitutional tendency. However, if the person did not develop the disease, doctors interpreted this an outcome of careful living, suggesting also the influence of external environmental factors.[186] In parallel with heredity theories, some germ theories were emerging. In the 1850s, in public health medicine, one classification of diseases was proposed to distinguish those that were spread or arose: through water or air from human or environmental sources (miasmatic); through person to person contact (contagious); in the blood through poor diet (dietetic) or from invasion of animal or plant materials infection the

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[184] See C Rosenberg, "The Bitter Fruit: Heredity, Disease and Social Thought" in C Rosenberg, *No Other Gods-On Science and American Social Thought,* (Baltimore, Johns Hopkins University Press, Revised and Expanded Edition 1997) pp 25-54.

[185] See Rosenberg, "The Bitter Fruit" pp 30-31

[186]W Bynum, "Darwin and Doctors: Evolution, Diathesis and Germs in Nineteenth-Century Britain", *Gesnerus,* Volume 40, 1983, pp 46-47.

body (parasitic). [187] Bynum contests that the emergence of germ theories in Europe resulted in a few doctors attempting to integrate diathesis and germ theory to explain specific diseases, which introduced more precise explanation of disease aetiology.[188]

In the case of pulmonary tuberculosis, identification of the presence of pathological tubercles (nodules) in lung tissue, led to doctors naming this disease tuberculosis, although it was also known as phthisis or consumption.[189] The microscopic discovery of the tubercle bacillus by Robert Koch in 1882 did not change doctors' views of the causes of pulmonary tuberculosis (i.e. that it could be an inheritable disease) and was met with scepticism by some doctors. This attitude is evident from papers presented at the fiftieth meeting of the British Medical Association in 1882.[190] For example, a paper presented at this meeting by a Dr Williams suggested that it was difficult to reconcile Koch's research on the infectious nature of tuberculosis with predisposing poor environmental and social conditions and the hereditary factor of the disease.[191] Another doctor expressed opinions that family history in relation to disease contagion should not be dismissed because of the new germ theory of disease.[192] Thus doctors who were highly experienced at dealing with cases of tuberculosis were expressing their concerns on how to rationalise between the predisposing factors of the disease and the acquisition of the infectious agent. In the early 1900s, the medical view persisted that development of tuberculosis required the synergy of the invading tubercle and a vulnerable human constitution. Worboys suggests that at the time doctors represented the body's reaction to this invasion as a "seed and soil" metaphor, with the tubercle bacillus

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[187] For an account of nineteenth-century germ theories see M Worboys, *Spreading Germs Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000), pp 1-43.
[188] See Bynum, *Darwin and Doctors,* p 49.
[189] See Worboys, *Spreading Germs,* pp 194 -197.
[190] See British Medical Association, "Fiftieth Annual Meeting, Proceedings of Sections", *The British Medical Journal,*1882, Volume 2, (1135) pp 617 - 630.
[191] Dr Williams was a physician at the Brompton Hospital for Consumption. See C Williams, "The Contagion of Phthisis", *The British Medical Journal,*1882, Volume 2, (1135) pp 618-620.
[192] Dr Robertson was the Medical Officer at the National Hospital for Consumption Ventnor. See R Robertson "Family History in relation to contagion in Phthisis Pulmonalis" *The British Medical Journal,*1882, Volume 2, (1135) pp 624–626.

acting as the seed and the soil being the human immunity, predisposition and diathesis (constitutional strength). [193] For example, in 1902 a Dr Stephen Mackenzie delivered a lecture where he proposed that since the discovery of the tubercle bacillus "we are apt to think too much of the seed and too little of the soil".[194] Whilst Mackenzie discussed reducing transmission of tuberculosis by improving social conditions and housing he also focused on personal diathesis and the inheritance of the disease from infected parents, believing that what he labelled "the personal factor" was of equal importance to the pathology of tuberculosis. In the late nineteenth and early twentieth-centuries, doctors also labelled tuberculosis as consumption or phthisis and these had connotations for the sufferers, with consumptives and their families being thought of as "tainted". Worboys shows that doctors framed personal diathesis to tuberculosis in terms of a latent effect that would emerge later in life as a result of being compromised by other factors such as poor diet, living conditions, alcohol consumption and gender.[195] In the early 1900s, clinical approaches and public health disease management changed to manage the effects of the tubercle bacillus (the seed) and also by strengthening the individual response (the soil). This was required because by this time the disease was accepted as one of complex aetiology of which infection was one part. [196] Public health doctors and clinicians held different opinions on how this could be achieved. Clinicians used sanatoria and fresh air regimes which were at the forefront of healing approaches whilst public health doctors were focused on improving social and sanitary conditions.

Predisposition to and acquisition of tuberculosis was also relevant to the industrial workplace, with many industries affected by the contraction and spread of the disease among the workforce. Most factory workers lived in poor social conditions with poor, damp

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[193] See Worboys, *Spreading Germs,* pp 3-7.
[194] Dr Mackenzie was a physician at the London Hospital. See S Mackenzie, "The Powers of Natural Resistance or The Personal Factor in Diseases of Microbic Origin", *The Lancet,* 1902, Volume 159 (4109) pp 1513-1517.
[195] See Worboys, *Spreading Germs,* p 159.
[196] See Worboys, *Spreading Germs,* pp 231-232.

housing, inadequate food and also suffered exhaustion from long working hours. Therefore their constitutional resistance to the disease would always likely to be less than the higher social classes. Many people were employed in industries whose operations generated large amounts of dust including mining, stonecutting, metal working and textile manufacture. These workplaces were very dusty and poor standards of cleanliness and hygiene persisted. Dust inhalation was recognised as a causal factor in the development of phthisis. This was recognised by early occupational health doctors, for example Arlidge wrote a chapter on the pathology of dust inhalation in his book as a preface to the chapters on mining and quarrying. Arlidge reported that industrial cases of lung diseases including asthma, bronchitis, fibrous and tubercular consumption) were the cause of the highest mortality among British workers. He discussed "phthisical lungs being prepared for the germination and multiplication of bacilli", i.e. damaged lung tissues predisposing workers to developing tuberculosis.[197]

McIvor examines the occupational aetiology of tuberculosis in the early twentieth-century and suggests that in the medical debates of disease predisposition and acquisition, there were doctors who believed the workplace was a secondary source of cross-infection and transmission of the disease with the primary source emanating from the home environment person to person contagion, and personal diathesis.[198] These doctors were largely from the public health domain who viewed tuberculosis from an epidemiological perspective and thus were challenged by doctors who believed it was a hereditary disease.[199] Workplace reforms such as improving ventilation, banning spitting and wet sweeping to dampen dust were proposed as environmental control measures to limit transmission and acquisition of the disease in the workplace. Personal hygiene, poor housing, overcrowding and poor nutrition

[197] See JT Arlidge *The Hygiene, Diseases and Mortality of Occupations*, (London: Percival and Son, 1892), pp 244-258.
[198] A McIvor, "Germs at Work: Establishing as an Occupational Disease in Britain, c.1990-1951", *Social History of Medicine,* Volume 25(4), 2012, pp 812-829.
[199] They were mostly Medical Officers of Health.

were also identified as personal measures that workers could adopt. Inhaling dust at work had for many years been associated with respiratory illnesses and recognised by occupational labels such as miners' phthisis and potters' rot. This was especially from inhalation of silica dust resulting in silicosis. However, Koch's discovery of the tubercle bacillus introduced tensions and uncertainty between infection and physical damage to the lungs by dust inhalation at work. In the first decades of the twentieth-century a synergistic relationship was demonstrated between silicosis and tuberculosis in miners and stone workers.[200] Another example is from the textile industry, where transmission of tuberculosis between the workforce was implicated during the process of "shuttle kissing", whereby to replenish empty shuttles with threads, workers use mouth suction to draw the end of the new thread spool on to the shuttle. Wooden shuttles were shared between workers, so the opportunities for cross infection were high. The work environment in cotton mills was also conducive to the viability of the tubercle bacillus, being extreme dusty from raw cotton processing and of high humidity which was required to prevent cotton threads breaking.[201] As Dale *et.al* argue because there was lack of medical consensus about the risks of shuttle kissing it was not deemed a health risk to workers. By contrast in America, shuttle kissing was banned in 1911 because it was medically acknowledged as a health risk. Doctors in Britain adopted a social response to disease prevention, suggesting personal hygiene, and morality as key factors in the acquisition of tuberculosis.[202] Although occupational health historians have largely focused on the relationships between workers lungs damaged by dust inhalation of dust and subsequent acquisition of tuberculosis because of workplace environmental factors, individual predisposition was also of importance. Although the public health solution was to control the external factors, individual factors such as predisposition

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[200] See McIvor, "Germs at Work", p 816; Bufton and J Melling, "Coming up for Air", pp 63-86; D Rosner and G Markowitz, *Deadly Dust,* pp 15 -31.

[201] See P Dale, J Greenlees and J Melling, "The kiss of death or a flight of fancy? Workers' Health and the Campaign to Regulate Shuttle Kissing in the British Cotton Industry, c.1900-52," *Social History,* Volume 32(1), 2007, pp 54-75.

[202] See Dale, Greenlees and Melling, "The kiss of death or a flight of fancy?

and constitutional resistance were also considered part of the aetiology of tuberculosis in the workplace.

The debates and discussions surrounding the equal importance of heredity, personal diathesis, and pathology of tuberculosis and identification of the tuberculosis bacillus in 1882 were contemporaneous with the emergence of telegraphists' cramp in the Post Office. If telegraphists' cramp is examined in the same frame as tuberculosis in the workplace, there could be an argument made that certain telegraphists would have a predisposition to developing the disease, where the Morse key represents the seed that "infects" the soil. As discussed later in the thesis, the Post Office eventually addressed predisposition and acquisition tensions by pre-employment screening to exclude potential telegraphists with predispositions and by improving working conditions to strengthen the resistance of those already in the workforce who contracted telegraphists' cramp.

2.3 Medical theory and diagnosis of writers' cramp

The Lancet was the first medical journal to publish articles on writers' cramp by printing transcripts of lectures on scriveners' palsy delivered by Samuel Solly at St. Thomas's Hospital London in late 1864.[203] In a similar fashion to the early encounters with telegraphists' cramp that will be discussed later, Solly described scriveners' palsy as a "rare disease". Early on in the first lecture, Solly stressed "upon your early correct diagnosis may depend the health and happiness of your patient", a belief that other doctors would subscribe to in later years. He described the signs and symptoms as reported by the patient and that he observed via examination as a means to identify scriveners' palsy:

[203] See Samuel Solly "Lectures on Scriveners' Palsy".

> the disease shows itself outwardly as palsy of writing powers [where] muscles cease to obey mandate of the will. It comes on very insidiously, the first indication being a painful feeling in the thumb or forefinger of the writing hand, accompanied by some stiffness.

He further suggested "these unnatural sensations subsided during the hours of rest and sleep to return with the writers' work on the next day". Solly acknowledged the relationship between fatigue and onset of cramp and pain and how the benefits of rest periods decreased rapidly over time. This was some years before the paper by Poore discussed concepts of acute and chronic muscle and nerve fatigue and its relationship to scriveners' cramp.[204] In the following lectures, Solly reinforced how the disease can be cured when detected at an early stage. The second and third lectures ventured into the physiological theory of scriveners' cramp with reference to cerebral and spinal function. In the second lecture Solly stated that previous medical literature had not proposed any physiological or pathological explanation of the disease.[205] He then explained that an aching spine in a subject with scriveners' palsy was significant and indicative of central spinal cord involvement in the condition. The evidence base for his theory was formed from examination of affected patients with pain in the lower cervical and upper dorsal regions of the spine. Solly was initially indecisive about "whether the nervous power that coordinates the muscles of the writer resides in the cerebellum or the spinal cord" but then favoured the spinal cord based on newly published knowledge.[206] He described in detail the spinal nerve and muscle interaction required to provide the muscular coordination for writing, but also stressed that nerve activity did not originate directly from the brain but from "a group of mutually connected

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[204] See Poore, "On Fatigue".

[205] Solly cited the works of the German pathologist Rudolf Virchow and also neurologist Moritz Romberg who had both written articles on writers' cramp. Virchow was best known for his proposal that pathological processes in the body start to occur in individual cells rather than organs and tissues. For a summary biography see http://www.britannica.com/biography/Rudolf-Virchow, last accessed 10/05/2019.

[206] Solly quoted the work of Schroeder Van de Kolk and Lockhart Clarke (a former student of Solly). Van Der Kolk had published in 1859 a treatise on the minute structure and function of the spinal cord and medulla oblongata. Lockhart Clarke published a letter in *The Lancet*. See J Lockhart Clarke, "On the Functions of the Corpora Dentata Cerebelli", *The Lancet,* 1858, Volume 72 (1828) pp 288-289.

ganglionic cells, which receive the stimulations of will along the anterior white columns which [in turn] result in the motor filaments of a nerve producing a uniform action", i.e. movement in the muscle.[207] Solly proposed that acceptance of this theory justified that scriveners' palsy must depend on disease or disturbance of these spinal cells. The third lecture was very much proof of concept to his theory of spinal cell disease being the causative factor for scriveners' palsy. He used microscopic and post mortem evidence (the granular degeneration of ganglionic cells) as a further justification of the relevance of the pathology to the disease.[208] In all three lectures, Solly made extensive use of relating detailed case histories for the cases he had seen and the treatments administered.

Some years later, in a similar style to Solly, Poore delivered a lecture to the Royal College of Surgeons.[209] He started with the premise that "for a thorough understanding of the hand, a knowledge of nervous relations of the hand is necessary". Poore moved away from Solly's (microscopic) cellular ganglionic theory and focused at a more structural and functional level on the role of the grey matter of the brain in controlling hand and upper limb movements. He provided a very detailed account of the relationship between arm and hand movements and the part of the brain (the fissure of Rolando) which "controls the special movements of the hand". Poore illustrated the complexities of nerve, spinal cord and muscle interaction in the brachial plexus (the nerve supply to the arms) by using a model of different coloured wools. After some general discussion on muscle paralysis and its causes, he focused on a detailed examination of hand and arm musculature and neurology, and the effects of paralysis in restricting movements. Paralysis of the ulnar nerve was highlighted as vital for "delicate manipulation" as "it supplies all the intrinsic muscles of the hand" and when paralysed would

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[207] Solly was actually describing an early interpretation of a neuro-muscular junction.
[208] Solly cited the post mortem results of a 65 year old man with scriveners' palsy symptoms of five years duration, who had died as a result of an acute attack of laryngitis.
[209] This was the inaugural Bradshaw Lecture. These were prestigious lectureships given at the invitation of the Royal College of Physicians and Royal College of Surgeons on London, first instituted by bequests. See GV Poore, "Nervous Affections of the Hand", *The Lancet,* 1881, Volume 118 (3027) pp 405-407 and *The Lancet,* 1881, Volume 118 (3029) pp 493-496.

make “writing impossible”, but this was not in the context of occupational injury or disease. The rest of Poore’s discussion was on the subject of brain paralyses of clinical origin affecting the upper limbs, rather than on occupationally related cramps. Interestingly, in this lecture, Poore did not refer to his earlier theory about the effects of chronic muscle and nerve fatigue on hand function.[210]

Between 1878 and 1887, and summarised in two reports, Poore analysed one hundred and sixty eight cases which he documented as “writers’ cramp” and “impaired writing power”. He diagnosed all these cases based on case histories of the patients he examined and took samples of their handwriting.[211] In 1878, he initially identified thirty two cases (out of seventy five reviewed) as being “true writers’ cramp” and “who had brought on their troubles by overwork at their profession”. He added to this group nineteen cases of neuritis and neuralgia, even though they reported not working long hours. The rationale for this was that they presented with symptoms that more closely resembled writers’ cramp than the other cases examined, for example irritability and nerve tenderness in the hand and arm, numbness and cramps. In his conclusions to the first review of cases, Poore refuted the idea of a “special coordinating centre for controlling writing” by proposing there was sufficient evidence to suggest peripheral changes to muscles and nerves:

> The evidence of peripheral change consisted of:
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> a. Definite muscular paresis
> b. Definite muscular spasm
> c. Localised tremor
> d. Fibrillary tremor of certain muscles

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[210] See GV Poore, “On Fatigue”.

[211] See GV Poore, “An Analysis of Seventy Five Cases of Writers’ Cramp and Impaired Writing Power*”, Medico-Chirurgical Transactions,* 1878; 61:116-146 and “An Analysis of Ninety Three Cases of Writers’ Cramp and Impaired Writing Power*”, Medico-Chirurgical Transactions,* 1887, Volume 70 pp 301-333.

e. Alteration of muscular irritability

f. Localised pain

g. Nerve tenderness

One or more of these conditions was always present. The writers' cramp of the text books, in which failure of writing power is the sole symptom, I have never seen.

Poore justified conflating the "lack of history of overwork" cases with those of "true writers' cramp" by suggesting writers' cramp was a "fatigue disease" and defining the use of "fatigue" as a label for a recognisable and known condition of uncertain pathology. In this definition, fatigue could also refer to mild inflammation of motor nerves produced by overwork, accidental strain or, rheumatism.[212] In the second paper, he subsequently included cases of neuritis and neuralgia, resulting in one hundred and seventeen cases examined over approximately a ten year period. In the second report Poore described a physical examination procedure particularly intended to test the ulnar nerves and discover areas of nerve tenderness.

Poore suggested that:

> every case of writers' cramp requires a careful and prolonged examination, for my experience shows that hardly any two cases resemble each other in all particulars. By methodological examination we must first exclude all recognised morbid states of the nerve centres or nerve joints, ligaments and muscles.

Gowers, who had introduced the term "occupation neurosis" in 1886, published a second volume of his text book in 1888. He included in the second volume, a new and separate

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[212] See Poore, "An Analysis of Seventy Five Cases of Writers' Cramp and Impaired Writing Power", pp138-140.

chapter devoted to what he named “occupation neurosis”, which included a concise definition:

> [a] convenient designation for a group of maladies in which certain symptoms are excited by the attempt to perform some often repeated muscular action, one involved in the occupation of the sufferer.

He added to this definition by justifying that “cramp” was a commonly used label for the most frequent symptom (spasm) which disturbed or prevented performance of intended movements, and that use of the word cramp was qualified by “the special action or occupation that excites the disorder, such as writers’ cramp or telegraphists’ cramp”.[213] The chapter on occupation neurosis included a long discussion of writers’ cramp (eight pages) but included only a short paragraph on telegraphists’ cramp. Gowers attributed the origin of telegraphists’ cramp to Onimus (see next section) but must have been more knowledgeable than this since he described the effects of cramp leading to miscoded telegraph messages and then stated he had seen one case. Gowers was a prolific contributor of many articles on neurology to *The Lancet*, both before and after publication of this book, although I could find no evidence that he published further articles on occupational neuroses.[214]

The development of medical theory concerning writers’ cramp indicates a progression from the beliefs of Solly which centred on spinal cord disease or disturbance to those of Poore and Gowers some twenty years later, which defined the condition as one peripherally affecting muscles and nerves of the upper limbs. By this time fatigue, the effects of repetitive movements and occupation of those affected were also factors that were taken into

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[213] See WR Gowers *A Manual of Diseases of the Nervous System Volume 2* (London: J & A Churchill, 1888), pp 656-676.

[214] Between 1886 and 1890 Gowers published a series of article: “Notes on the Functions of the Nervous System”. See for example, *The Lancet,* 1886, Volume 127 (3277) pp 1153-1154*, The Lancet,* 1890, Volume 135 (3479) pp 955-956*,* and *The Lancet,* 1890, Volume 13 (3480) pp 1006- 1007.

consideration as part of the diagnostic process. One emerging theme that I have identified arising from an analysis of some of the theories and diagnoses of writers' cramp is that much knowledge was gained and reported through the use of evidence from case histories of affected patients, although in some cases, particularly with writers' cramp, not all of the cases were occupationally related. The use of physical examination diagnostic processes as advocated by Poore to investigate muscle and nerve function was another routine by which doctors could establish a diagnosis of writers' cramp. I propose that the prime reason for these reports was to disseminate professional knowledge to medical colleagues, but perhaps also to elicit responses or confirmation from medical peers that actions taken were appropriate in terms of diagnosis and ensuing treatments. By comparison, the amount of medically reported information about telegraphists' cramp in the mid-1800s was confined to the reports of just four doctors reporting they had examined patients with the symptoms.

2.4 Early medical perspectives and commentaries on telegraphists' cramp

2.4.1 A neurophysiological approach

The first interest in telegraphists' cramp in Britain was demonstrated by two young doctors and physiologists (Onimus and Bianchi) in France and Italy, whose other interests included the treatment of neurological conditions using electrical methods. In Britain also, electricity was viewed by Victorian society (including doctors) as a positive result of industrial progress, to be celebrated as an achievement of their time. Industrial progress was recognised to have pervaded most aspects of late nineteenth-century lives in one way or another. Therefore, electricity was found in the medical world and in the late 1800s doctors viewed it as a novel treatment for a range of illnesses, with some specialising in electrotherapy and hospitals

setting up electrical treatment rooms.[215] The first recognition and labelling of telegraphists' cramp as an occupational disease was observed and reported from France, by a physiologist and doctor, Ernest Onimus, in 1875 and reported in British medical journals.[216] Onimus described the signs and symptoms of telegraphists' cramp as an "affection analogous to writers' cramp".[217] On publicising the condition, Onimus remarked that it "is not uncommon among telegraph clerks especially those that use Morses's instrument". Onimus commented that the affected workers called the condition "the telegraphic complaint, and it may henceforth be designated as "telegraph clerks' cramp". From that point onwards in time the disease was identified and labelled as such, although translated into English as the shortened 'telegraphists' cramp'. Onimus reported two cases, and the reporting of specific cases of telegraphists' cramp while acknowledging there were likely to be other workers with this condition undetected, would be a recurrent observation made by other medical practitioners in the tracking of telegraphists' cramp.

In 1877, an Italian neuropathologist, Dr Leonardo Bianchi, reported the second occurrence of telegraphists' cramp. At the time, Bianchi was described by *The British Medical Journal* as a "private lecturer in neuropathology and medical electricity in Naples" (presumably at the University).[218] Bianchi's published article discussed treatment of "Professional Dyscinesiæ" where he mainly focused on scriveners' cramp, but he reported out of interest one case of telegraphists' cramp he had seen. He stated that the intention of his report to the *British*

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[215] See for example, Samuel Wilkes, "Abstract of a Lecture on the Therapeutic Use of Electricity", *The British Medical Journal,* 1873, Volume 1 (628) pp 28-30; A Hughes Bennett, "The Principles of Electro-Therapeutics" *The British Medical Journal,* 1884, Volume 2 (1247) p 1006; and a later publication by WJ Morton, "A Brief Glance at Electricity in Medicine", *American Institute of Electrical Engineers, 1893*, pp 555-623, retrieved from http://ieeexplore.ieee.org/Xplore/home.jsp, last accessed 10/05/2019. For an overview of Victorians and electricity see IR Morus, *Shocking Bodies: Life, Death and Electricity in Victorian England* (Stroud, Gloucestershire: The History Press, 2011).

[216] See "Telegraph Writers' Cramp", *The British Medical Journal*, 1875, Volume 1 (746) p 515, and article "A Telegraphic Malady", *The Lancet,* 1875, Volume 105 (2695) p 585.

[217] Writers' cramp (also known as Scriveners' cramp) was a well-recognised occupational disease in 1875 and (before) by most physicians.

[218] See Leonardo Bianchi, "A Contribution on the Treatment of the Professional Dyscinesiæ", *The British Medical Journal*, 1878, Volume 1 (890) pp 87-89.

Medical Journal was "[to attract] the attention of the Association to the treatment of the disease", but he was referring solely to the general collection of signs and symptoms labelled as Scriveners' (writers') cramp. I suggest that telegraphists' cramp was mentioned because he wanted to report finding the second case and also because he, like Onimus before him, recognised it as an analogous entity to Scriveners' cramp. Both Onimus and Bianchi were much focused on treatment of signs and symptoms, their relationship to fatigue and seeking a cure using electricity, however this was in a general medical sense, rather than in the context of occupational health, even though Onimus did associate telegraphists' cramp with the use of the Morse key. Neither Onimus nor Bianchi published any further papers or reports on the subject of telegraphists' cramp.[219] In Britain these initial reports had little impact on the medical profession. Even Poore, whose paper appeared in *The Lancet* a few months after the Onimus report, did not include telegraphists when he stated his conviction that writers' cramp was the outcome of chronic local fatigue resulting from overwork and irregular muscular actions. Thus, Poore did not frame or qualify his view of writers' cramp by contextual reference to occupational health.

When medical journals published the Onimus and Bianchi reports, telegraphists' cramp was afforded a low profile in both *The British Medical Journal* and *The Lancet* in Britain.[220] *The British Medical Journal* referenced the telegraph workers themselves naming the complaint rather than this originating from Onimus or other medical professionals. I propose this was an attempt to discredit it because it originated from the workforce rather than medical doctors, but then concluded "in England the malady is said to be unknown" suggesting that this perhaps was not quite a genuine condition. *The Lancet,* although it assigned nearly two

[219] Onimus continued work as a neurologist, publishing as an expert in Baillieres medical textbooks, and later worked in the area of heliotherapy. Bianchi later specialised in psychiatry and experimentation on the frontal lobe of the brain.

[220] Bianchi's report was not reported in the *British Medical Journal* until approximately four months after the reading at the British Medical Association conference suggesting it was not especially newsworthy. Bianchi's report was not acknowledged in *The Lancet* at all.

complete columns of reporting to the Onimus finding, named it “A Telegraphic Malady” as if it were some rare medical curiosity. The commentator compared it to writers’ cramp, as a common disorder, followed by a more general discussion about “all other forms of “professional disorders” (e.g. milkers’ cramp and bricklayers’ cramp), which it deemed “so rare as to be looked upon as curiosities”. There was a confident assertion that “Telegraphists’ cramp will, we have little doubt, take its stand among the last-mentioned curiosities” (i.e. the milkers and bricklayers). The second part of this article was a lengthy and more scientific discussion on the physiology of muscle movements and fatigue when muscles are subject to constant and prolonged repetition and cited the work of Poore on fatigue. Both medical articles conveyed the message that telegraphists’ cramp was not a significant problem in Britain. There is a possibility that publication of the reports might have raised some awareness of the condition among the medical communities, but then the message that telegraphists’ cramp was a curiosity prevailed, suggesting that this was not a serious issue for the medical world to consider.

2.4.2 An experimental approach to telegraphists’ cramp

In 1884, a paper appeared authored by Thomas Fulton which I argue would prove to be ground breaking in terms of its content, detailed observations and recorded data concerning the physiological requirements of telegraphists.[221] Thomas Fulton graduated in medicine from the University of Edinburgh in 1884 but also worked as a telegraphist in the Edinburgh Post Office whilst he was a student. He was not employed in an occupational medical role, nor was he a Post Office Medical Officer.[222] So whilst his status is not clear, it is evident that

[221] See Thomas Wemyss Fulton, “Telegraphists’ Cramp”, *The Edinburgh Clinical and Pathological Journal,* 1884; Volume 1 (17) pp 369-375.

[222] It is not really apparent what Dr Fulton’s status was in the Post Office. Although he graduated in medicine all of his ensuing career was as an ocean fisheries and law specialist. See the Oxford Dictionary of National Biography for further details, retrieved from http://www.oxforddnb.com/view/article/57609 , last accessed 10/05/2019.

he was interested in telegraphists' cramp because of its effects on the muscle physiology of those affected.[223] As an early career physician, perhaps he saw his career path in experimental physiology, a growing and developing area in the late 1880s.[224] The introduction to Fulton's paper demonstrates an awareness of Onimus's findings and also of "trade palsy, or the loss of the power to perform the specific coordinated movements of certain occupations".

Using an innovative methodology Fulton monitored the telegraphists in the workplace using the Morse key, as if they were subjects in a physiology laboratory (see Figure 2-1). He detailed the operation of the Morse key, working speeds of Morse code transmission and finger, hand and arm movements and measured muscle contractions. [225]

Figure 2-1 Morse key model in use from 1880 to 1950

[223] This can be ascertained from the last paragraphs of Fulton's paper where he expresses a desire to undertake further physiological work on telegraphists' cramp.
[224] For accounts of the development of biological experimental laboratory sciences in the nineteenth century see for example Henning Schmidgen, "Of Frogs and Men: The Origins of Psychophysiological Time Experiments, 1850-1865", *Endeavour,* 2002, Volume 26 (4) pp 142 -148 and Sven Dierig, "Engines for Experiment' Laboratory Revolution and Industrial Labor in the Nineteenth–Century City"', *OSIRIS*, 2003, Volume18 pp 116-134.
[225] Fulton is likely to have developed his method by extrapolating his academic experimental physiology knowledge to devise a new protocol for workplace monitoring of the telegraphists.

(Photograph: downloaded from Science museum website).[226] This would of course have had wired connections to enable conversion of the vertical Morse key movements into electrical signals which could be transcribed into text at the receiving end. Also see Appendix A for a Morse key diagram.

At this time, many physiologists (for example Helmholtz and Marey) were experimenting with measurement of muscle activity and developing recording devices such as kymographs and myographs so Fulton, with a keen interest in physiology, was likely to be aware of their work.[227] Fulton suggested that the telegraphists' working speeds while using the Morse key could be related to the number and duration of muscle contractions. According to Fulton, the paper recording of the Morse code message would produce the equivalent of a myographic trace, with the Morse dots and dashes representing the duration of the Morse key depression (flexor muscle contraction), with the intervals between representing the elevation of the key. Fulton was thus able to produce quantifiable graphic representations of muscle activity much in the same way as his European contemporaries (Marey and Helmholtz). Fulton explained his reasoning in his paper:

> each time the (Morse) key is depressed the core is magnetised and the ink wheel, pressing against the running slip, produces a linear mark, whose length is equal to the duration of the depression of the key, and therefore to the duration of the flexor contraction. Similarly, the length of the interruptions between the linear marks represents the duration of the elevation of the key that is of extensor contractions. Hence it follows that the recording slip presents us with an accurate myographic

[226] Images freely available from https://www.sciencemuseum.org.uk/objects-and-stories), last accessed 10/05/2019.
[227] For a detailed discussion of the work of Marey see Rabinbach, *The Human Motor*, pp 84-119 and Soraya de Chadaverian for an historical account of the development and use of kymographs and myographs by Marey and Helmholtz. See Soraya de Chadaverian, "Graphical Method and Discipline: Self-Recording Instruments in Nineteenth-Century Physiology", *Studies in History and Philosophy of Science Part A,* 1993, Issue 2 pp 267-291.

picture of the number, kind, duration and relativity of succession of the muscular contractions.

Fulton related muscle activity to the telegraphists' working conditions. He specified the data for number of muscle contractions per minute, duration of movement and the average speed of working. He then extrapolated the number of muscle contractions per hour "between thirty and forty thousand" and noted that on "busy circuits" an operator may be "engaged constantly for nearly eight hours". He postulated that limited range of movement, the high number of contractions and their speed, the "difference of duration, and variability of succession, constitute the important and differential features of the Morse manipulation" (see Figure 2-2).

Flexor Contractions	Extensor Contractions
Short 183 Duration 0.05 sec. Long 114 Duration 0.15 sec	Short 174 Duration 0.05 sec. Long 88 Duration 0.15 sec Longer 35 Duration 0.30sec

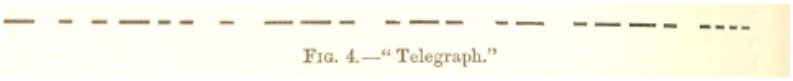
"*The calculation of the duration is made from experiment. The number of contractions varies with the words".*

Figure 2-2 Fulton's experimental data on muscle contractions

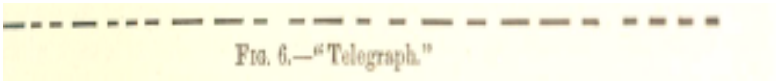
As well as collecting physiologically based data, Fulton explored operator skill level and psychological aspects of cognitive function required to perform the role. He focused on Morse coding errors to examine this aspect and hypothesised that an operator could avoid letter coding errors by mental adjustment, i.e. by actively thinking about some individual letters as combinations of others. He demonstrated this by example:

For instance, the operator, by picturing to his mind S (···) and T (—) and substituting a short for a long extensor contraction succeeds in producing V(···——). Similarly, C may be frequently made by picturing N (——·) N (——·) to the mind and varying the duration of the intervening extensor contraction.

However coding errors could result from muscle spasm in the finger extensor and contractor muscles. Fulton demonstrated this “malco-ordination” by including code print outs of the word ‘telegraph’ in his paper:



The normal version of the Morse code for the word “Telegraph



The malco ordinated version of the Morse code for the word “Telegraph” – extensor muscle affected

Figure 2-3 Fulton’s demonstration of affected coordination

Fulton argued against Onimus’s claim that telegraphists’ cramp affected those of a “nervous temperament”. From the experimental data, subjects demonstrating coding errors and cramp symptoms were not “excitable and hysterical” in the way Onimus had described them, and Fulton was able to support this using the objective data he had collected. Fulton related muscle contraction problems to loss of precision in transmitting Morse code messages and introduced increasing operator age as a characteristic leading to loss of muscular

coordination and manipulation. He postulated that loss of manipulative dexterity would result in coding errors and associated different letter coding errors to the flexor and extensor muscles of the hand. Fulton's work was the only experimental work ever undertaken to identify the visible results of a telegraphist contracting cramp and the resulting effects on their work output i.e. word coding errors. It was cited by medical doctors at the 1911 enquiry into telegraphists' cramp and also much later in 1927 by the Industrial Fatigue Research Board (IFRB) investigators. I argue that this provided a significant contribution to the understanding of telegraphists' cramp as an occupational musculoskeletal disease, yet the findings were never reported by either *The British Medical Journal* or *The Lancet*, despite the emerging interest in occupational neuroses by doctors.

2.5 Treatment of writers' and telegraphists' cramp

Articles about the treatment of both writers' cramp and telegraphists' cramp appeared in medical journals. These articles detailed occurrence, diagnosis and treatment in case histories of individual cases doctors had examined. The treatments prescribed by doctors included a combination of a wide range of different therapies, some medically administered, and others requiring the patient's cooperation to help themselves in finding a cure. There is no obvious chronological relationship between treatments prescribed and the changes in diagnosis theory that occurred with occupational neuroses i.e. the changed view between the 1860s and the 1880s, that these conditions were peripheral rather than central nervous system conditions of the spine and brain. However, some treatments became more widely prescribed and more popular as time progressed. The range of treatments included: rest, medication, electrical treatments, exercise and massage, self-help and work aids. The treatments I discuss in the following narrative below appear to be the most prescribed

interventions for relief of symptoms, as measured by their appearance in the medical literature.

Rest cures

From the very early reported cases of writers' and telegraphists' cramps, "entire rest" from writing or telegraphing was recommended as part of a greater treatment regime.[228] Solly and Poore were great advocates of prescribing rest as a treatment, but both insisted that a rapid cure was only possible if the disease was diagnosed and treated at an early (acute) stage.[229] Solly proposed that for longer term (chronic) cases of writers' cramp, three months rest was required, and commented that Virchow in Germany was not seeing successful cures because "[they] do not insist upon entire rest of the paralysed hand from writing".[230] Doctors often prescribed a seaside holiday or long voyage for rest and relaxation. In Britain it is inconclusive whether this prescribing was influenced by reports of Beard about neurasthenia and treatment using the Weir Mitchell rest cure in America, but certainly in the 1880s British doctors were prescribing the rest cure mostly for female neurasthenic patients.[231] It is therefore likely that when Robinson diagnosed the four cases of telegraphists' cramp in 1882 and recommended rest and holidays for the two female staff he was aware of the literature concerning females and their perceived greater susceptibility to neurasthenia.[232] Not all doctors agreed with the rest theory though, especially as time progressed. For example, Monell in America, discussing telegraphists' and writers' cramps, believed that in acute

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[228] Samuel Solly, "On Scriveners' Palsy", *The Lancet*, 1867; Volume 89 (2280) pp 561-562. This was before the first cases of telegraphists' cramp were reported.
[229] See Solly, "On Scriveners' Palsy", and Poore, "An Analysis of Ninety-three Cases of Writers' Cramp and Impaired Writing Power".
[230] See Solly, "On Scriveners' Palsy".
[231] See Thomson, "Neurasthenia in Britain: An overview" in Gijswijt-Hofstra and Porter (eds.) *Cultures of Neurasthenia,* pp 77-97.
[232] See Edmund Robinson "Cases of Telegraphists' Cramp", *The British Medical Journal* 1882, Volume 2 (1140) pp 880.

cases symptoms returned after rest and that in chronic cases long term rest caused deterioration of work performance.[233]

Medication

Medication would often be prescribed in conjunction with other treatments. Drugs such as grains of strychnine (which has nerve and muscle effects), nerve and iron tonics, and topical application of potassium iodide plasters, or painting with iodine to tender parts of the upper limbs were prescribed.[234]

Electricity

Electrical treatments were also prescribed. As discussed above, the Victorians were fascinated by electricity as a new and powerful force. Guys hospital in London had set up an "electrifying room" in 1836, where different electrical treatments were delivered.[235] It is hardly surprising therefore that electrotherapeutics were used for nerve and muscle disorders, and their use persisted for occupational cramps in the second half of the nineteenth century. Electrical treatments mainly used galvanic currents to the hands, upper limbs and neck.[236] Monell, an electrotherapeutic practitioner, wrote extensively on the benefits of galvanic treatments for occupational cramps, even providing detailed instructions on how to set up the galvanic apparatus in the treatment room.[237]

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[233] Samuel Monell was a medical practitioner in Brooklyn, New York, who taught electrotherapy and radiography but who also treated many cases of occupational cramps. See SH Monell, *The Cure of Writers' Cramp and the Arm Troubles of Telegraphers and Ball Players (*NewYork*:* JB Taltavall, 1898), pp 17-18.

[234] Poore was an advocate of the use of plaster and iodine. See Poore, "An Analysis of Ninety Three Cases of Writers' Cramp and Impaired Writing Power*"*.

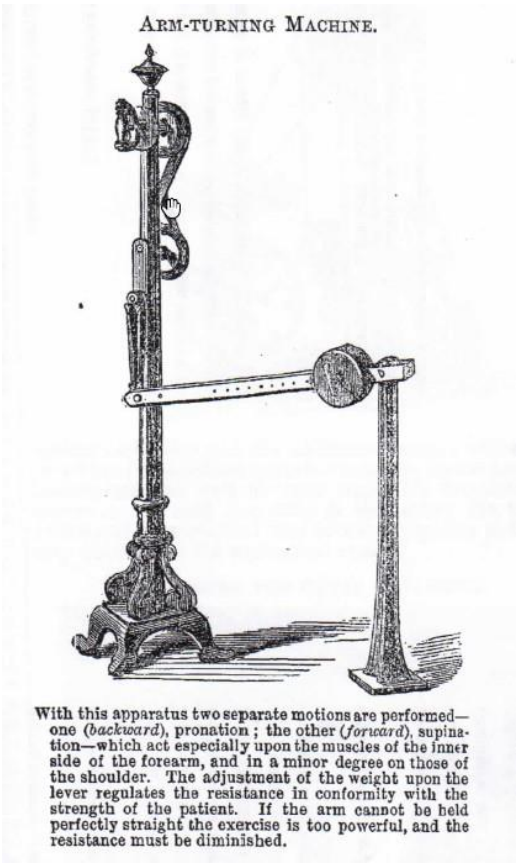
[235] Morus gives an account of the use of galvanic medicine. See Morus, *Shocking Bodies: Life, Death and Electricity in Victorian England,* pp 81-92.

[236] For example, Bianchi applied a current to the cervical spinal axis of the patient. See Leonardo Bianchi, "A Contribution on the Treatment of the Professional Dyscinesiæ". Solly and Poore also describe galvanic treatments. See Solly, "On Scriveners' Palsy", and Poore, "An Analysis of Ninety Three cases of Writers' Cramp and Impaired Writing Power*"*.

[237] See SH Monell, *The Cure of Writers' Cramp and the Arm Troubles of Telegraphers and Ball Players,* pp 21-23*.*

Exercise and massage

Physical exercise and massage were treatments that gained in popularity from the 1880s onwards, in some cases supported by key figures in the medical profession. A two page report submitted by a British doctor to *The Lancet* promoted the merits of gymnastic exercises developed by a Swedish doctor (Dr Zander) "as a valuable aid to therapeutics in Sweden".[238] The article described, with the aid of diagrams, various machines that could be used for different muscular complaints, but one in particular ("the arm-turning machine") was recommended for upper limb cramps (see Figure 2-4).[239]


ARM-TURNING MACHINE.

With this apparatus two separate motions are performed—one (*backward*), pronation; the other (*forward*), supination—which act especially upon the muscles of the inner side of the forearm, and in a minor degree on those of the shoulder. The adjustment of the weight upon the lever regulates the resistance in conformity with the strength of the patient. If the arm cannot be held perfectly straight the exercise is too powerful, and the resistance must be diminished.

Figure 2-4 Zander's Arm turning machine

[238] The doctor was T Gilbart-Smith, an assistant physician to the London Hospital. See T. Gilbart-Smith "A Brief Outline of Dr Zander's Mechanico-Therapeutical Instititution in Stockholm", *The Lancet, 1881,* Volume 117 (3013) pp 860-862.

[239] The machines resembled early versions of modern day gym machines, but as well as increasing resistance they could provide rubbing, chopping or shaking movements i.e. actions that a masseur would administer.

From 1882, further reports appeared in the medical journals promoting the benefits of massage and hand exercises as treatments for writers' cramp, in particular quoting the work of Julius Wolff, a massage practitioner.[240] *The British Medical Journal* articles cited Wolff's method as a combination of "shampooing (massage) and hand and finger exercises performed three to four times a day". A later editorial article in *The British Medical Journal*, however, claimed that rigorous use of the Zander machines could produce the same results as Wolff's methods. From this point forwards, Julius Wolff attained almost celebrity status among doctors for his successful treatment of writers' cramp. It is curious that Wolff was feted and accepted by the medical profession, as he was a lay practitioner.[241] In Fleckian terminology this could be interpreted as a layperson becoming part of an esoteric thought collective. Wolff's novel success rate at treating writers' cramp must have appealed to doctors who were struggling to seek cures for the disease. In particular Wolff was championed by one London doctor, Dr de Watteville, who had published two papers on the cure of writer's cramp in 1885. He had introduced the term "professional neuroses" to describe occupational cramps and cited affected professions.[242] De Watteville reported on Wolff's treatment success rate in London and Germany and concluded that with this treatment regime "writers' cramp can no longer be said to defy therapeutic measures". He argued that the success of the treatment derived from the fact that it was "purely peripheral", and this suggested to him writers' cramp was not a condition of "central origin" (i.e. arising

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[240] See for example "The Treatment of Writers' Cramp", *The British Medical Journal*, 1882, Volume 1 (1117) p 790 and J Kingston-Fowler, "The Treatment of Writers' Cramp", *The British Medical Journal*, 1882, Volume 2 (1139) pp 839-840. For a modern reference, see also A Mason, "Rub, Rub, Rubbish: Massage in the Nineteenth Century", *Physiotherapy,* September 1992, Volume 76 (9) p 666.

[241] Julius Wolff was in fact a calligrapher from Frankfort-am-Main who became a masseur. He was well known to, and highly respected by the medical profession. For a fuller description of him, see J Quintner, "Apropos Rub, Rub, Rubbish: Massage in the Nineteenth Century", *Physiotherapy,* January 1993, Volume 79 (1) p32.

[242] Dr de Watteville was the physician in charge of electrotherapy at St Mary's Hospital, London. The terminology he used was several years before Gowers introduced "occupation neurosis". See A de Watteville "The Cure of Writers' Cramp", *The British Medical Journal*, 1885, Volume 1(1259) pp 323-324 and A de Watteville, "Further Observations on the Cure of Writers' Cramp", *The Lancet, 1885,* Volume 125 (3218) pp 790-791.

from the spine or brain).[243] This theory received no challenges through the pages of the medical journals, because it was consistent with Poore's and Gower's views. The other important aspect that de Watteville emphasised was that Wolff did not act independently of medical doctors and would only treat patients under the auspices of medical direction. This would have increased his reputational standing as being a credible practitioner in the doctor's perspective. Wolff was also clearly concerned with his own reputation as he clarified an earlier report of an intractable case which had reported the time taken to cure as being much longer than it was.[244] In 1890, Wolff eventually wrote a full article in which he summarised his methodology, in the process demonstrating a thorough knowledge of occupational neuroses and discussing "the secret" of his treatment success.[245] He attributed this to massage and exercises influencing the "psychically affected centre" of the patient. This, he argued, depended on having "an exact knowledge of the ailment and the patient in order to attain the best material and moral effects". His view was not that divergent from that of Solly or Poore and their insistence on careful examination and exact diagnosis. Wolff explained that the purpose of his paper was to explain his theory and treatments "so that they may have some practical use to those who occupy themselves with the treatment of the disease".

Another approach specifically dealing with writers' cramp was to try and alleviate pain and discomfort in the workplace of the affected person. Poore in his 1878 paper suggested "the American type-writer, a machine which is worked by keys like a piano" could be used instead of handwriting.[246] A commentary published in the *British Medical Journal*, promoted the use

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[243]See de Watteville "The Cure of Writers' Cramp", *The British Medical Journal*.
[244] See Alex Knight "The Successful Treatment of Writers' Cramp", *The British Medical Journal*, 1887, Volume 2 (1400) p 939 and the response from Julius Wolff, "The Successful Treatment of Writers' Cramp", *The British Medical Journal*,1887, Volume 2 (1403) p1131.
[245] Julius Wolff, "The Treatment of Writers' Cramp and Allied Muscular Affections", *The British Medical Journal*, 1890, Volume 2 (1542) pp165-166.
[246] See Poore, "An Analysis of Seventy Five Cases of Writers' Cramp and Impaired Writing Power*", Medico-Chirurgical Transactions,* p145.

of a penholder developed by Professor Nussbaum of Munich.[247] Its principle was to enable writing by using the finger extensors and abductors (i.e. the antagonistic muscles), rather than the flexors and adductors normally used. The report discussed how Professor Nussbaum effectively carried out a usability trial by advertising in the local papers for people with writers' cramp to try this device. Although the number of participants was not stated, the trial was deemed successful as none of the subjects developed muscle pain. Another example of a device for relieving symptoms was a custom-made tin metal 'glove' which fitted round the thumb and two fingers. This was believed to make the extensors rather than the flexors work by the action of the metal pressing against the muscles.[248]

2.6 Conclusion

My purpose within this chapter has been to create an analysis of occupational neuroses. I have explored these themes against the development of an industrialised society. My focus has been writers' cramp and its similarities to telegraphists' cramp in terms of medical diagnosis, treatment, and practitioners involved (both professional doctors and lay persons) and, to also examine the medical relationships between writers' cramp and telegraphists' cramp. The commonality of these two conditions is that both were framed within the broader term "occupational neurosis" but at this very early stage in the lifecycle of telegraphists' cramp there was a scarcity of medical knowledge and evidence to differentiate them as distinct diseases. The available evidence suggest that doctors viewed them as variable manifestations of the same condition. I introduced miners' nystagmus at this stage in the thesis to provide a comparative exemplar of a different occupational disease, but one that

[247] See "Writers' Cramp", *The British Medical Journal*, 1882, Volume 2 (1137) p750.
[248] M Prince "A New Apparatus for the Relief of Writer's Cramp", *The Journal of Nervous and Mental Disease,* 1893, Volume 18 (3) pp 194-196.

was also classified by medical professionals as an “occupational neurosis” and which would be of significance later in the history of telegraphists’ cramp.

Writers’ cramp attained greater medical prominence than telegraphists’ cramp in the nineteenth century, although an early article (by Solly) suggested that it was a “rare disease”. This is comparable to the first report of telegraphists’ cramp where the condition was deemed a “[rare] medical curiosity”. Unlike the slow and intermittent nature of the reporting of telegraphists’ cramp, records for writers’ cramp indicate more emphasis and research on the physiology, diagnosis and treatment of the disease and more discussion by doctors to report case histories and their diagnosis and treatment. I propose that this was because writers’ cramp had the capacity to potentially affect everyone, rather than just those occupationally affected. I also suggest that it may have attained some form of recognition; the treatments and theories of Julius Wolff certainly seemed to have attracted some celebrity status. Historical evidence indicates that theories of causation changed over approximately a twenty year period with a change from being of cerebral origin to that of a peripheral sensory condition and the emergence of the term “occupational neurosis”. In terms of medical theory of both conditions, this suggests there was an observed progression from the central cerebral and spinal cause to that of peripheral muscle and nervous disorders of the upper limbs. Neither Poore nor Gowers identified specific muscle and nerve involvement although Poore argued that ulnar nerve paralysis could disturb the manipulative ability of the hands and fingers.

Fulton experimented further and analysed muscle contractions in terms of duration which he then related to finger flexor and extensor contractions. Fulton investigated telegraphists’ cramp from a physiological perspective using the workplace as a laboratory and taking measurements whilst the telegraphists were carrying out their normal work. This was extremely innovative for the late 1880s. It would be more than forty years in Britain before

IFRB scientists would adopt monitoring of workers at their place of work. Nothing similar was undertaken for writers' cramp, probably because it would be too difficult to measure muscle group activities involved with the complexities of writing and different writing styles adopted, whereas the Morse key had a single mode of operation. Although it is possible that there was some variability in telegraphists' operating style. The closest activity to Fulton's investigations was Poore's passive analysis of handwriting samples obtained from patients with symptoms, but Poore interpreted this solely for the purposes of diagnosis to positively confirm cases of writers' cramp. In terms of treatments there was no visible shift to new approaches when doctors changed their view that writers' cramp was a peripheral rather than a central cerebral / spinal condition. From the few cases of telegraphists' cramp reported, similar treatment regimes were prescribed as for writers' cramp. Treatments did reflect to some extent the American culture's response to neurasthenia, for example rest and relaxation, massage and electrical therapies. The other parallel that can be drawn from the neurasthenia phenomenon is the success of individual practitioners in treating the disease. Julius Wolff was applauded for his individual case approach to massage treatment for writers' cramp. This resonates with Weir Mitchell's success as a celebrity doctor for treating neurasthenia in women, except that Julius Wolff was a lay practitioner and not a qualified doctor.

In conclusion, the historical evidence has not provided any definitive data that would support doctors identifying writers' cramp and telegraphists' cramp as being two discrete diseases in the late 1800s. After initially framing them as being of cerebral origin, doctors later diagnosed these conditions as being peripheral diseases of the muscles and nerves, probably as a result of Gower's theories. Prescribed treatments for both conditions were more often than not the same and it appears from the medical case histories reported that both required a thorough physical examination and a patient history of signs and symptoms to frame the diagnosis. I argue that any differential labelling of the two conditions occurred solely through

patient reports of their occupation, work tasks and time spent working, whether they were using a pen or operating a Morse key and, by symptoms observed by the doctors on examination. Using Fleckian principles, I would draw the conclusion that for writers' cramp, emergence of knowledge derived from patients (i.e. the lay community) assisted in formulating medical diagnoses and informing communities of medical practitioners. This occurred mainly through individual doctors writing to the medical journals rather than by a process of collaboration and collective thinking among the profession as a body. Another conclusion I would draw is that in terms of the broad category of occupational neuroses, writers' cramp dominated medical knowledge of these conditions. One exception to this is miners' nystagmus, where although doctors treating miners initially disagreed about its causation and subsequent diagnosis, there was later consensus about the disease and a clear relationship between the nature of work tasks such as working underground with high muscular exertion in low lighting levels and, symptoms reported by miners. Miners' nystagmus was to become significant later in the history of telegraphists' cramp as it provided an example for the compensation process that would be sought by the telegraphists.

3 The emergence of telegraphists' cramp in the Post Office

3.1 Background

Telegraphists' cramp is rarely mentioned by historians of occupational health. On the few occasions that the disease has been scrutinised, historians have tended to strongly identify it with writers' and other occupational cramps, but have commented that it emerged soon after the introduction of telegraph technology into the workplace.[249] Although Dembe highlights the initial reports of telegraphists' cramp from Onimus in France, there is some assumption made that "it was not long before a growing number of medical cases were reported in Britain and elsewhere".[250] This assumption may have been reinforced by the historical knowledge that the telegraph network was expanding rapidly in Britain, was employing more staff, and the numbers of telegraph messages sent were increasing almost exponentially. However, on examination of historical records I do not find evidence to support the view that telegraphists' cramp was becoming a prominent occupational disease in the late 1800s. Whilst a few cases were reported in the medical journals in the 1860s and 1870s, the condition attracted no wider interest among doctors at that time. In medical writings, telegraphists' cramp has not been treated in the same way as discussions concerning hazardous occupational diseases such as lead or phosphorous poisoning were. However, as discussed in Chapter 2, the few cases of telegraphists' cramp reported were identified as being of occupational origin, evidenced by its classification in the late 1880s as an occupational neurosis.

Compared to the large numbers of writers employed in the late nineteenth century, among the telegraph workers, trade unionism developed and became strongly supported. Similarly

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[249] See A Dembe, *Occupation and Disease - How Social Factors Affect the Conception of Work-Related Disorders* (London: Yale University Press, 1996), p 35.
[250] See Dembe, Occupation and Disease, p 37.

to the matchmaking trade, pay and not the occupational disease were the prime motivation for union activism.[251]

In this chapter, I will provide an account of the early history of telegraphists' cramp during the second half of the nineteenth century, exploring its social and historical context within the Post Office. I will first evaluate the origins of the Post Office Medical Service, and investigations of the first cases of telegraphists' cramp reported to Post Office doctors. Secondly and building on the discussion in Chapter 2 of the thesis, I will examine the discussions of the co-existence of telegraphists' and writers' cramp in the Post Office through the medium of communications and discussion in their trade union publications and in house journals. Thirdly in a social context and from the telegraphists' perspective, the rise of trade unionism in the Post Office is investigated. A short while after nationalisation, from private sector to state employees in 1870 Post Office telegraphists became a unionised community within the Post Office.[252] Becoming unionised led the telegraphists (and other Post Office employees) to campaign for better pay and working conditions through several government committees. This improved positioning, and the political stance of the telegraph unions would eventually influence the campaign for compensation for injury caused through the occupation.[253]

Lastly, I will consider telegraphists' cramp from a Fleckian perspective. However, as the disease emerged there appears to have been little or non-existent "formalised" collective

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[251] See B Harrison, "The Politics of Occupational Ill Health in late Nineteenth-Century Britain: The Case of the Match Making Industry"*. Sociology of Health and Illness*, 17(1), 1995, pp 20-41.
[252] Although when the telegraphists were privately employed, there had been an attempt to form a trade union in 1866 in Manchester by a group of Manchester telegraphists who proposed rules for prospective members of an association to be named the Telegraph Clerks Association. See *Proposed Rules for Telegraph Clerks and Messengers Associations,* POST 65/1(Nov to Dec 1866), London: Royal Mail Archive.
[253] See the Second Report of the Departmental Committee on Compensation for Industrial Diseases 1908 (London: His Majesty's Stationary Office 1908).

thinking and discussion among the telegraphists, their unions, Post Office management and the Post Office Medical Service.

3.2 The Post Office Medical Service

The Post Office Medical Service was established in 1855, with the first report of the appointed Chief Medical Officer appearing as an Appendix to the second Postmaster General's report.[254] The service was in place fifteen years before the Post Office nationalised the private telegraph companies in 1870.[255] The Medical Officers employed were generally local general practice physicians who covered a district or town. By 1871 their number increased, with the Postmaster General reporting the recruitment of an additional twenty five Medical Officers to cover more districts and towns in Britain.[256] Clinton argued that the impetus for setting up the service was politically motivated rather than being for employee welfare, with the Medical Officers acting in a policing role on behalf of the Post Office.[257] Documentary evidence substantiates this view of the role with the stated remit in the 1871 Postmasters General's reports:

> To examine candidates for appointment.
>
> To attend, either at the office or at their own homes and to supply with medicine all servants of the Department whose pay does not exceed 150 [pounds] a year; and even to those whose pay exceeds that amount, to give advice during an epidemic. To visit, on the

[254] Lord Argyle was the Postmaster General and Dr Waller Lewis the first appointed Chief Medical Officer. See Second Report of the Postmaster General 1856, London: His Majesty's Stationary Office 1856.
[255] McIlvenna suggests that the expansion of the Post Office Medical Service was a result of nationalising the telegraph service. For an account of the setting up of the Post Office Medical Service in 1855 see K McIlvenna, D Brown and D Green, "The Natural foundation of Perfect Efficiency' Medical Services and the Victorian Post Office", *Social History of Medicine* published online January 23rd, 2019. Available from http://dx.doi.org/10.1093/shm/hky123, last accessed 10/05/2019.
[256] See Seventeenth Report of the Postmaster General 1871, London: His Majesty's Stationary Office 1871.
[257] See A Clinton, *Post Office Workers: A Trade Union and Social History* (London: George Allen and Unwin, 1984), pp 47-49.

requisition of the local postmaster, anyone absenting himself from duty on the plea of illness

To certify as to the unfitness or otherwise for further duty of all applicants for superannuation

To attend especially to the sanitary condition of the local Post Office

The medical officers appointed therefore, "while protecting the Department against unnecessary absence on the part of its servants, [will] provide them gratuitously with attendance and medicine in cases of real illness".[258] As well as attending to the real medical needs of employees, doctors were expected to do some employee attendance monitoring and carry out pre employment medical screening of all Post Office applicants with face to face interviews. The Post Office also issued guidance documents to its medical officers.[259] It is evident that the Post Office was at the forefront of setting up a "company specific" occupational medical service even though the doctors were not employed by them on a full time basis. Established in the 1870s, this was a new approach to dealing with occupational health and disease issues in the workforce. Later in the 1890s, measures adopted by industrial employers and government to deal with specific hazardous processes and workplaces that constituted the dangerous trades were controlled by regulation and managed by the Factory Inspectorate. Significantly a Post Office doctor was not monitoring any specific occupational health issues, but was more of a general physician practitioner, with additional roles of investigating absences from work.

After the rapid expansion of the Post Office in the 1870s, telegraphists in common with other Post Office workers, became dissatisfied with their pay, work grades and working

[258] See Seventeenth Report of the Postmaster General 1871, p25.
[259] See for example, *General Instructions Issued to Medical Officers,* POST 64/7(Dec 1880), London: Royal Mail Archive; and *Probation and Medical examinations,* POST64/23 (May 1894), London: Royal Mail Archive.

conditions.[260] Formal trade unions were established during this time period. The Postal Telegraph Clerks Association (PTCA) was established in 1881 and was the first trade union recognised by the Post Office. In the late 1890s and early 1900s, trade union activism resulted in the establishment of a series of government enquiries to look at pay and working conditions.[261] Against this background of emerging industrial relations, the Post Office Medical Officers formed their own "Trade Union", the Association of British Postal Medical Officers (ABPMO). The origins and reasons for setting it up are obscure, but commentaries on the annual general meetings and conferences are found in both *The Lancet* and *British Medical Journal* which date from 1894.[262] These journal reports describe the nature of the organisation. *The British Medical Journal* describes "its special purpose, which is the bringing together of a large number of professional men into touch". *The Lancet* endorsed this: "these men who hitherto have had an isolated official interest, [although they] engage in common work". Both journals suggested that most of the Post Office Medical Officers were members of the Association, with *The Lancet* indicating that membership is a "recognised requirement amongst postal medical officers". As well as discussing committee matters, the journal articles reported on other medical matters, for example in 1894, there was a discussion concerning alcoholism among Post Office employees.

Reports of the annual events in the succeeding years demonstrate a more assertive and unionised stance by the ABPMO towards the Post Office. For example, The *British Medical Journal* annual conference report in 1899 noted discussions on equality and uniformity in the performance of Post Office Medical Officer duties, noting that the Association was asserting

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[260] After the nationalisation of telegraph service by 1873 telegraph messages doubled to 15 million a year and quadrupled by 1885. See Clinton *Post Office Workers: A Trade Union and Social History* p35.

[261] The enquiries (named after the chair) were: Tweedmouth 1897; Hobhouse 1906-1007 and much later Holt and Gibb (1912 and 1914 respectively) See A Clinton, *Post Office Workers,* pp 152-201 for a very detailed account of these committees and ensuing actions.

[262] See "The Association of British Postal Medical Officers" *The British Medical Journal*, 1894, Volume 2 (1756) p438, and "The Association of British Postal Medical Officers", The *Lancet,* 1894, Volume 144 (3704) p 460. Both these journals reported on this annual event until approximately 1910.

its right to defend its members as a body against Department regulations.[263] At this time, the Medical Officers would have had knowledge of the postal workers' increasing demands for improved pay and employment conditions. There is evidence of further disquiet amongst the Post Office Medical Officers in the early 1900s. For example, between April and June 1903, a series of letters from Medical Officers appeared, expressing concern over the recruitment of new medical staff by the Post Office. The main grievances concerned expansion of the service by subdividing of the areas and districts, resulting in lower remuneration of existing staff and, lack of advertising of vacant posts.[264] Reports from the Annual Conference of the ABPMO ceased to appear in *The Lancet* and *The British Medical Journal* from 1911 onwards, although the Association continued until the early 1920s, when it sought recognition within the British Medical Association and became a separate committee of that organisation.[265]

3.3 Telegraphists' cramp in the Post Office

The first detection of telegraphists' cramp by a Post Office Medical Officer occurred in August 1882. Dr Edmund Robinson, employed by the Post Office in Leeds and a lecturer on anatomy in the Leeds School of Medicine, reported to the annual meeting of the British Medical Association in August 1882 that he had seen four cases of telegraphists' cramp.[266] Initially two cases were seen: a female aged 26 (Miss C) who had been working as an "efficient" telegraph clerk for eight years and a female aged 22 (Miss D) who was a telegraph

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[263] See "The Association of British Postal Medical Officers", *The British Medical Journal*, 1899, Volume 2 (2010) p101. The trigger for this discussion appeared to be that one of the local Post Office Medical Officers had rejected a job candidate.

[264] A series of articles appeared in *The British Medical Journal.* See for example H Alderson "Post Office Medical Appointments" *British Medical Journal*, 1903, Volume 1 (2211) p 1183 and J Hamilton *The British Medical Journal*, 1903, Volume 1 (2207) p 943.

[265] See for example, *Post Office Medical Officers: British Medical Association*, POST 122/12606 (12 May 1920 to-28 Nov 1921), London: Royal Mail Archive.

[266] See Edmund Robinson "Cases of Telegraphists' Cramp", *The British Medical Journal* 1882, Volume 2 (1140) pp 880.

clerk of “one year’s duty”. As Robinson had never encountered this condition before, he searched the medical journals and found the Onimus and Bianchi reports. This led him to research and investigate the telegraphists in the Leeds Post office for signs and symptoms. He did not report how he did so, but he found two “well marked examples of this malady”, a Mr B aged 31 and an HJ aged 20, who had both been telegraph clerks for sixteen or seventeen years and six or seven years respectively. For the four cases he found he reported a detailed account of symptoms, treatment and outcomes. Robinson suggested that his findings corroborated those of Onimus because “it is almost entirely in the telegraphists thus employed that this malady occurs”. He further suggested that the onset of it among the telegraphists varied because of “the differences of individual temperament and the condition of their nervous systems.” He then speculated that of the two females affected one had a “neurotic disposition” and the other may have been affected by “emotional causes” which may have started “this train of symptoms”. He therefore supported the Onimus theory of nervous temperament being a factor in the disease development. In the concluding paragraph, Robinson proposed that “this affection” might be classed with scriveners’ and other types of palsy. He justified it by relating the signs and symptoms as being related to the work duties being performed. His report concluded that

> as this form of spasm has never been recorded as met with among the telegraph-workers in this country, I thought they would therefore be of interest to members of this Association.[267]

Robinson had qualified in 1867 and was an experienced physician and a lecturer in anatomy as well as holding his Post Office role. I propose that once he had linked the cases in Leeds to the previous reports, he identified telegraphists’ cramp as a novel condition (much like Onimus and Bianchi) and reported it out of curiosity and academic interest. Interestingly,

[267] See Robinson, “Cases of Telegraphists’ Cramp”.

throughout the report Robinson did not associate the labels of “telegraph clerks’ cramp” or “telegraphists’ cramp” to the cases and the symptoms reported. He aligned the symptoms to those of scriveners’ palsy, a well-recognised occupational disease at this time, which he is likely to have observed and probably lectured on to his anatomy students. He agreed that the disease had “curiosity” status, much like the previous reports of the condition discussed above (see Chapter 2.4) and did nothing to extend its study, for example by proposing any further monitoring of the telegraphists’ at Leeds Post Office. Robinson did no further investigation and had no further work published on telegraphists’ cramp or indeed other medical subject areas. By the early 1900s, he had retired both as a medical practitioner and as Post Office Medical Officer.

In the Post Office Medical Service, there was no tangible interest, reaction or comments to either Robinson’s or Fulton’s report which appeared in 1884. In the case of Fulton, I suggest that it is possible that the journal where the report was published was not widely read by general physicians such as the Post Office Medical Officers.[268] However most general physicians possibly read the *British Medical Journal* and the title of Robinson’s paper provided some indication as to the content of the report. Some Post Office Medical Officers may have even heard Robinson talk to the annual meeting of the British Medical Association in August 1882. I have found no evidence to suggest that either of these reports made any impact on the Chief Medical Officer of the Post Office. The Chief Medical Officer did not begin to issue Annual Reports on the health of Post Office workers until 1892, and later they were incorporated as an Appendix within the Postmaster General’s Annual Report to parliament .[269] In the Chief Medical Officers reports, there was one case of telegraphists’

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[268] *The Edinburgh Clinical and Pathological Journal.*

[269] See for example, *Chief Medical Officer’s Annual Reports* POST 64/16 (1893-1901) and POST 64/17 (1901-1913), London: Royal Mail Archive. The medical reports did not appear in the Postmaster General’s Annual Report until 1898, see for example *The Forty-fourth report of the Postmaster General 1898,* London: His Majesty’s Stationary Office 1898.

cramp listed as grounds for retirement in 1893, and none in the following years up to 1900.[270] In the report for 1900, however, there were four cases of telegraphists' cramp cited as grounds for retirement. In both years, the Chief Medical Officer made no specific reference to it as a problem among the workforce; the focus of his reports was on statistics showing mortality, infectious diseases, and numbers retired or invalided out from the Post Office.[271]

3.4 The coexistence of telegraphists' cramp and writers' cramp in the Post Office

Despite increasing numbers of workers employed in banks and insurance companies throughout the nineteenth century the historical evidence I have reviewed indicates that there was no discussion of writers' cramp among those with the condition. By contrast, although there were only a few published cases of telegraphists' cramp in the medical journals, I found evidence that there was some knowledge of the existence of both writers' and telegraphists' cramp among the telegraphists, and many believed they suffered from both diseases. This is demonstrated through two sequences of letters that appeared in *The Telegraphist* in 1884 and *The Telegraph Journal in* 1892.[272] *The Telegraphist* published a short letter from "Sufferer", which commented on an earlier report that had appeared in St Martin's magazine about the Onimus findings.[273] They discuss the symptoms, but the most interesting statement is that this is "a disease pretty common among telegraphists".[274] The letter identifies difficulties in manipulating messages as a result of the condition and asks other readers for information about cures and treatments. This generated only one reply from "Anxious", who reinforced "Sufferers" concerns rather than offering solutions, especially by

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[270] There were a few cases (less than five) of writers' cramp reported each year for Britain.
[271] The format of these reports consisted mainly of tables of data, with little commentary or interpretation.
[272] These were the in house journals of Post Office telegraphists and were printed weekly.
[273] This journal preceded *The Telegraphist.* It was named after the Post Office Headquarter building in London (St Martins Le Grande). The Central Telegraph Office (CTO) was located within it. Note, Onimus was not named in this article.
[274] *The Telegraphist,* MSS.148/PT/2/2/1 (December1st, 1884), Warwick: Modern Records Centre Archive.

commenting “the complaint is becoming so general, I think it is almost a matter which in their interest the department should take steps to check”.[275] No further comments on this appeared until one month later when a telegraph supervisor (JG Payne) responded, not about the telegraphists’ cramp issue, but suggesting a remedy for writers’ cramp:

> For twenty years I have been writing at maximum speed and have never felt the slightest cramp for this reason: I do not clasp the pencil, but use my arm freely, thus freeing the wrist from all strain. The remedy is this: hold the pencil lightly, do not clutch it; use the arm freely; write boldly; writing direct from the wrist is bound to have ill effects.

Payne, the supervisor, was clearly suggesting that keeping muscles relaxed and possibly not leaning on the desk had allayed writers’ cramp. However, the response to “Sufferer” addressed only writers’ cramp and gave no mention to telegraphists’ cramp. I was unable to determine if this response was a genuine misunderstanding of the previous correspondence or a device to defuse any suggestions about telegraphists’ cramp becoming an issue within the Post Office. The latter theory seems plausible as both “Anxious” and Payne entitled their letters “Telegraphists’ Cramp”.[276]

The 1892 sequence of letters started with a two page letter from a correspondent named “Socrates”, headlined “Cramp”.[277] This recognised occupational cramps including naming writers’ cramp and telegraphic cramp, and (mistakenly) suggested that the cause was a digestive disorder which affected the nerves and muscles. Like the earlier correspondents, “Socrates” suggested that telegraphists’ cramp:

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[275] *The Telegraphist,* MSS.148/PT/2/2/1 (February 1st, 1884), Warwick: Modern Records Centre Archive.
[276] The true identity of the two writers or where they worked is unknown but given the names they used they probably had symptoms of telegraphists’ cramp. It is not known where Payne worked as a supervisor.
[277] *The Telegraph Journal,* MSS.148/PT/2/3/2 (October 15th, 1892), Warwick: Modern Records Centre Archive.

> was more common in the telegraph service than can be imagined and that sufferers endeavoured to conceal it for as long as possible, a mistake because there was "genuine sympathy" for them in the ranks of the telegraph service.

Manipulation difficulties, coding errors and mental strain were mentioned as problematic for the sufferers. "Socrates" also commented that one of the telegraph supervisors did not believe in the disease but thought "it was more likely laziness or shirking". The letter concluded with a discussion of remedies and cures to "provide relief for the sufferer" but advocated that "each individual affected must, of course study his own particular case". The remedies and cures were discussed in terms of their merits. For example:

> keeping the right arm steady - particularly carrying the hand in the pocket – has been known to afford wonderful relief at work that or the following day. On the other hand by keeping the hand confined in a kid glove, and thus making it warm and flaccid, manipulation [of the Morse key] has been rendered almost impossible.

The narrative of "Socrates" continued with a discussion of the benefits of walking upon the digestive system. The writer alludes to cramp occurring to the "athletes of the service" and this being the result of over training or high nervous tension. He also recommended "carbonate of soda" for the digestive symptoms and "Turkish baths" as part of this treatment regime to alleviate the cramps. The identity of the writer is unknown, but his correspondence demonstrated an intimate knowledge of telegraphists' work duties, the role of telegraph manipulation in producing cramp symptoms and first-hand experience of the disease, so I would speculate that he was an experienced telegraphist. This letter provoked responses between October and December 1892 in *The Telegraph Journal,* all of which provided advice to other readers on how to prevent or cure cramp. Thomas Filmer's letter ("Cramp–its

cure") disagreed with Socrates suggestion that the disease was of digestive origin and proposed instead muscular origin.[278] His proposal for a cure was to practise "gymnastic exercises for the wrist and hand", which he described in detail, and also to modify writing style [when transcribing coded messages] by altering hand position. He advocated alternative strategies when operating the Morse key and slowing transmission rates. All of these had reportedly resulted in a cure for him. Exercise was the theme of letters by "Anti-stiff Wrist" and "Omega", who confirmed that finger exercises performed several times a day had relieved their symptoms.[279] Some of the authors, all using assumed identities, suggest they have "suffered severely" from telegraphic and writers' cramps".[280] Other suggestions included using different Morse keying techniques to avoid symptoms. "Cramp: how to prevent it" was published directly following Filmer's article and discussed how the act of telegraphing was controlled by "motor memory", based on the premise that the brain controls muscle motion. [281] The author (FLH) suggested that the way telegraphists were trained for their work was fundamentally wrong, and proposed a system similar to the way musicians are trained.[282] This was an ingenious proposal but it did not explain how this might prevent telegraphists' cramp other than that it might train the 'motor memory' and ear (to hear mistakes in keying). The final letter in this series was written by "Observer" in December 1892.[283] He broadly agreed with the opinions expressed by the previous correspondents but added a further dimension to the discussion by suggesting that badly constructed Morse keys were the origin of cramps. A badly constructed key could, he argued, result in operators

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[278] Filmer worked as a telegraphist in the Central Telegraph Office (CTO) London. Filmer said he based his conclusion from reading many articles about writing and cramp and severely experiencing both writers' cramp and telegraphists' cramp. See *The Telegraph Journal,* MSS.148/PT/2/3/2 (November 1st, 1892), Warwick: Modern Records Centre Archive.

[279] *The Telegraph Journal,* MSS.148/PT/2/3/2 (November 15th, 1892), Warwick: Modern Records Centre Archive.

[280] The telegraphists probably used assumed identities to prevent management identifying them as cramp sufferers and possibly forcing them to abandon telegraph work.

[281] Written by "FLH" also a telegraphist in the Central Telegraph Office (CTO) London. See *The Telegraph Journal,* MSS.148/PT/2/3/2 (November 1st, 1892), Warwick: Modern Records Centre Archive.

[282] A very complex description was provided of the Tonic Sol Fa way of learning musical notation and how this might be applied to every letter and figure that telegraphists use.

[283] *The Telegraph Journal,* MSS.148/PT/2/3/2 (December 1st, 1892), Warwick: Modern Records Centre Archive.

having to exert much more pressure and force to operate it, thus becoming tired, fatigued and susceptible to cramps. Whilst this theory may have deserved exploration, it attracted no further correspondence.[284]

I would suggest that these two sets of correspondence demonstrate several points. Firstly, telegraphists had some lay medical knowledge of both writers' and telegraphists' cramp, even if some of their interpretations were not wholly correct. Telegraphists were under extreme pressure to code and decode messages, so mental stress and strain simply from work pressure (aside from musculoskeletal pain and other symptoms) were highly probable.[285] Secondly, although telegraphists' cramp had made little impact in the medical world in terms of numbers affected, comments by the correspondents suggest that it was a problem recognised among the telegraphist work community. This needs cautious interpretation however, because the reports may have been based on exaggerated perceptions by the authors, all of whom appeared to have had (now or in the past) symptoms of either or both writers' and telegraphists' cramp at some stage. Thirdly, the advice to perform hand and finger exercises may have originated from articles in the press about the use of "gymnastics" to alleviate writers' cramp, or even reading reports about Julius Wolff and his techniques. The letter by Filmer mentions a book that contained exercises "to strengthen the fingers and wrists".[286] It is worth considering that whilst there was no mention of medical treatment interventions by either Post Office doctors or general physicians, undocumented exercise regimes may have been prescribed by doctors, although these doctors may not have been Post Office doctors. If they had it is likely the cases would have

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[284] There is no evidence of the Post Office undertaking any checks or maintenance being carried out on Morse keys, so it is possible that this could be a contributing factor to telegraphists' cramp.

[285] The effects of work pressure and its effects on the gastrointestinal tract were first proposed by Hans Selye in the 1940s as part of his General Adaptation Syndrome theory which eventually led to the concepts of work stress in the present day. It is widely accepted that digestive disorders can be a symptom of work stress. See M Jackson, *The Age of Stress - Science and the Search for Stability* (Oxford: Oxford University Press, 2016), pp 83-84.

[286] Filmer cited "a book by Mr Jackson" containing these. See *The Telegraph Journal,* MSS.148/PT/2/3/2 (November 1st, 1892), Warwick: Modern Records Centre Archive.

been reported. Interestingly, none of the authors suggested the use of patent medicines or quack treatments (which commanded a huge trade in the nineteenth century), despite some issues of *The Telegraph Journal* printing an advertisement for a remedy for "Telegraphic Cramp – An annoying complaint", although this does not mean that others affected did not self-prescribe these.[287] After these brief exchanges telegraphists' cramp disappeared from view for a few more years.

3.5 The political telegraphists

Before the formation of the PTCA there had been several unsuccessful attempts by the telegraphists to form a trade union.[288] In early 1881 support emerged for the telegraphists from the press and other trade groups to establish a trade union, and the PTCA was established in December 1881.[289] After its inception, the PTCA became a highly organised and, later a politicised union. Association rulebooks were kept detailing elected officers, membership details and committee structures.[290] In 1893 a PTCA booklet reported having six thousand members, of which two thousand were based in the London Central Telegraph Office (in St Martins Le Grand) and London districts.[291] The PTCA actively campaigned and issued printed materials such as a booklet on "Civil Rights" which included information such as job classification, discussions on inadequacy of pay and grade for permanent

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[287] For example, see the *The Telegraph Journal,* MSS.148/PT/2/3/2 (June 1st, 1892), Warwick: Modern Records Centre Archive. For a summary account of Victorian quack medicine see C Rance, *The Quack Doctor, Historical Remedies for All Your Ills,* (Stroud, Gloucestershire: The History Press, 2013).

[288] When the telegraphists were privately employed, there had been an attempt to form a trade union in 1866 in Manchester by a group of Manchester telegraphists who proposed rules for prospective members of an association to be named the Telegraph Clerks Association. See *Proposed rules for Telegraph Clerks and Messengers Associations,* POST 65/1(Nov – Dec 1866), London: Royal Mail Archive.

[289] See *Positions and Prospects of Telegraph Clerks*, MSS.148/PT/2/1/1 (March 1881), Warwick: Modern Records Centre Archive.

[290] See *Rules of the Postal Telegraph Clerks Association,* MSS.148/PT/2/1/1 (1888), Warwick: Modern Records Centre Archive.

[291] See the booklet *Civil Rights of the Postal Telegraph Clerks Association,* MSS.148/PT/2/1/1 (1893), Warwick: Modern Records Centre Archive. Membership of the PTCA was approximately one third of the workforce.

employment of temporary staff. In 1896 for example, a “Parliamentary Guide and Missionary Handbook” appeared.[292] One of the intentions of this was to summarise the new duties of the PTCA, which were to inform members of the “resolutions bearing upon parliamentary and propaganda work [that] were being adopted”. This was a strong campaign to promote lobbying of government, a call to make a case for setting up a central parliamentary committee with a salaried secretary as well as a drive to increase membership of PTCA through recruitment of new members. The handbook also listed all the branches of the PTCA and explained their role in awareness raising and marketing (i.e. “missionary work”). As well as producing the internal printed materials, the PTCA used an affiliation to several journals where it could publicise and promote itself and its policies, ran awareness raising campaigns, provide updates on management and parliamentary discussions, as well as publishing letters and technical articles.[293]

The various documents from the PTCA and journal publications provide strong evidence of the level of organisation and mission of a union that operated across Britain. Minutes were kept of district and regional meetings and there was an annual conference for members. The affiliated journals were another method of mass communication to both members and non-members of the PTCA. Another function of the journals was to play an educational role by publishing regular scientific and technical articles covering topics such as magnetism, electricity and the physics of telegraphy.[294] The telegraph was seen as new cutting edge technology in the nineteenth century, and I interpret from this that telegraph staff viewed themselves as professionally and technically minded people who embraced the use of new technology. Against this background it is striking that in the years leading up to 1900 there

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[292] This emanated from and was printed in Liverpool, where the PTCA was based. *The Postal Telegraph Clerks Association: Parliamentary Guide and Missionary Handbook,* MSS.148/PT/2/1/1 (1896), Warwick: Modern Records Centre Archive.

[293] These were initially *The Telegraphist* (until 1888), *The Telegraph Service Gazette,* and later *The Telegraph Journal* and *The Telegraph Chronicle*. See Clinton *Post Office Workers: A Trade Union and Social History* pp 234-235.

[294] See *The Telegraphist,* MSS.148/PT/2/2/1 (various dates), Warwick: Modern Records Centre Archive.

appears to have been no movement to form a collective opinion and perspective of telegraphists' cramp, despite the disease being associated with engagement with the new technology. There is no evidence in the PTCA records to suggest that there was any attempt to take up telegraphists' cramp as a cause to defend; their greatest priority was pay and grade grievances.

However, in the 1890s, the telegraphists did raise issues relating to general health and their work environments. For example, in the December 1889 edition of *The Telegraph Journal*, there was an article concerning the spread of consumption.[295] In December 1891 *The Telegraph Journal* published an article entitled "The Health of Electric Light" which stated that "the general health of staff at the Central Telegraph Office [London] has improved since electric lighting", although how these improvements were quantified is unclear.[296] This issue also published readers' letters complaining about lack of ventilation in their offices. It is not clear how much these grievances were directly orchestrated by the PTCA, but these examples illustrate that in the 1890s some telegraphists were concerned about working environments as well as their pay and grades. Concern about the health of telegraphists slowly gained momentum in the late 1890s, and was also raised as part of evidence given to the Tweedmouth Enquiry.[297] The Tweedmouth Committee's overall terms of reference was to review Post Office departments with regards to their revenue generation but working conditions were also part of the remit. Telegraphists from PTCA delegations presented evidence of the technical demands of their tasks and grades. Some witnesses presented evidence on duty rotas, work pressures, and constant physical strains of the job.[298] One of the proposals of the Tweedmouth committee was to place sorters and telegraphists on the

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[295] See *The Telegraph Journal,* MSS.148/PT/2/3/1 (December 1889), Warwick: Modern Records Centre Archive.
[296] See *The Telegraph Journal,* MSS.148/PT/2/3/2 (December 15th, 1889), Warwick: Modern Records Centre Archive.
[297] One of the inquiries into Post Office pay and conditions that functioned between 1895 and 1897.
[298] One witness was an Andrew Nicholson, Chairman of the London PTCA branch. See Clinton *Post Office Workers - A Trade Union and Social History,* pp 156-157.

same job and wages scales and to propose a new grade of telegraph supervisor, but with no change in pay scale increments. This action caused immense anger among the telegraphists and the PTCA balloted its members for a call to refuse overtime. 83% of those balloted voted for action, but nothing actually happened because of rivalry between the London and Liverpool PTCA branches. The Post Office response was to punish some of the prime movers in the PTCA with fines for inciting the overtime ban which could have resulted in strike action.[299]

In 1895 *The British Medical Journal* ran the headline *"*Unhealthiness of the telegraphists: their mortality greater than that of Sheffield Grinders".[300] This was referring to evidence given by Charles Garland to the Tweedmouth committee, which provided statistics on the numbers of deaths from phthisis in the Telegraph Service.[301] This generated ongoing articles written by Garland and published in *The Lancet and The Telegraph Chronicle.*[302] The latter publication supported the telegraphists throughout the Tweedmouth Enquiry by printing the full reports from Tweedmouth. The Chief Post Office Medical Officer (Dr Wilson) was called to give evidence to the committee at the end of 1895. He compared average annual sickness and death rates among telegraphists to those of the "general working population" (less than 9 days per annum) and also the Army and Navy (17 and 16 days respectively) and suggested that the statistics for the Post Office overall were much lower "1891: 9.9 [days], 1892:10.3, 1893: 10.4, 1894: 7.5". However, he also presented data which showed that senior telegraph clerk sickness rates were higher: "an average of 12.2 days" for the same

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[299] See Clinton *Post Office Workers - A Trade Union and Social History* pp164-165.
[300] See *The British Medical Journal*, August 31st, 1895, Volume 2 (1809) p555. Phthisis was a generic term in common use which could denote respiratory conditions and also pulmonary tuberculosis.
[301] He was a telegraphist but also chairman of the PTCA London Telegraphists branch and secretary to the United Kingdom Postal and Telegraph Benevolent Society. Garland's statistics indicated 45.4% of all telegraphist deaths were the result of phthisis, compared to 34.5% of Sheffield cutlery grinders. However, *The British Medical Journal* article (cited above), whilst it urged a cautious interpretation of these data as the proportions cited were for all deaths and not as a proportion of living telegraphists, still believed the 45.4% rate constituted "a notable fact and well worthy of careful attention by those in authority".
[302] "The Grievances of Telegraph Service Clerks" *The Lancet*, 1895; Vol 146 (3759): 695 and *The Telegraph Chronicle,* MSS.148/PT/2/4/3 (October 11th, 1895), Warwick: Modern Records Centre Archive.

four year period. This appeared as part of the Telegraph Chronicle front page headline "Rebutting Medical Evidence by Dr Wilson".[303] The Tweedmouth evidence continued to be reported in the press during 1896 and also spawned an article in *The British Medical Journal,* highly critical of the Post Office, and Dr Wilson's rebuttal of the statistics, even though he cited the sickness rates for telegraphists as being higher than those of other Post Office employees. The tone of the article suggested *The British Medical Journal* was in support of Charles Garland and later, a commentary on the lack of efficiency by the Post Office in the accurate portrayal of its health statistics, demonstrated more public criticism by *The British Medical Journal*.[304] This episode concluded with Charles Garland becoming somewhat appeased by the publication of the more accurate health statistics in the Forty-second Postmaster Generals' report.[305] It could be argued that politically these statistics were included to satisfy the PTCA and silence the medical journals. However, I suggest that the whole sequence of events surrounding the evidence given to the Tweedmouth Committee demonstrates that neither the Post Office workforce nor the commentators in the medical journals had much regard for the Post Office Medical Service. From his book on occupational diseases, Thomas Arlidge held a similar view. He commented that the Post Office Medical Department withheld information when he was attempting to present evidence on the health of Post Office staff as part of the chapter on Government Officials.[306] Arlidge was supported in his view by Charles Garland in his Telegraph Chronicle article "Health of the Staff" where he commented that the Postmaster General's report would not "aid him" (i.e.

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[303] See *The Telegraph Chronicle,* MSS.148/PT/2/4/3 (December 13th, 1895), Warwick: Modern Records Centre Archive. Dr Arthur Huelin Wilson was the Chief Medical Officer of the Post Office and he refuted the data presented by Charles Garland when he was called to give evidence to Tweedmouth.

[304] See "The Health of Post Office Telegraphists", *The British Medical Journal*, 1896, Volume 1 (1833) p 416 and "The Health and Mortality statistics of the Post Office", *The British Medical Journal*, 1896, Volume 2 (1868) p 1160.

[305] See "Health of the Staff" *The Telegraph Chronicle,* MSS.148/PT/2/4/4 (September 11th December 1896), Warwick: Modern Records Centre Archive and *The Forty-second report of the Postmaster General 1896,* London: His Majesty's Stationary Office 1896.

[306] Dr Thomas Arlidge wrote a comprehensive book: *The Hygiene, Diseases and Mortality of Occupations,* first published in 1892. He would be viewed today as a Doctor of Occupational Medicine. See JT Arlidge *The Hygiene, Diseases and Mortality of Occupations*, (London: Percival and Son, 1892), pp 104-105.

Arlidge) in providing "returns of longevity, health and prevalent maladies of those engaged in connection with electrical agencies and instruments" (i.e. telegraphists).[307] Charles Garland's interest and publications on the health of telegraph workers started to get workplace health more seriously considered by the PTCA.[308] However telegraphists' cramp was not considered by the PTCA and it would be a few more years into the 1900s until it gained notice as an occupational disease.

3.6 Conclusion

Telegraphists' cramp became a recognised occupational disease in the first decades of the 1900s, so I expected that there would be evidence of growing interest, concern and an increasing number of cases reported and diagnosed in the closing decades of the nineteenth century. However, my examination of the historical evidence does not support this hypothesis. There was little interest in it from the Post Office Medical Service (apart from rare curiosity value) to investigate further, even in a preventative mode. This was despite the wider medical profession acknowledging that telegraphists' cramp was an identified occupational neurosis. The fact that there was information available in the medical journals that would be read by most practising doctors raises an interesting question about the Post Office doctors and telegraphists' cramp. Some of the writers' cramp medical reports labelled telegraphists' cramp as an occupational cramp, but even that did not seem to cause a response from Post Office doctors in terms of acknowledging and reporting the condition before 1900. According to the lay reports in the telegraphist journals, some telegraphists report both writers' and telegraphists' cramps simultaneously, and these also indicate, albeit

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[307] See "Health of the Staff" *The Telegraph Chronicle,* MSS.148/PT/2/4/4 (September 11th December 1896), Warwick: Modern Records Centre Archive

[308] See for example the 20th Annual Conference of the PTCA in 1900 which discussed insanitary offices and phthsis in the Post Office documented in report in *The Telegraph Chronicle,* MSS.148/PT/2/4/7 (March 3rd, 1900).

from a small number of reports, that there was general concern about telegraphists' cramp. These reports also indicate some lay medical knowledge of the disease developing amongst a few telegraphists. This is apparent from their peer to peer correspondence printed in *The Telegraphist* and *The Telegraph Journal.* Many of these were submitted using assumed identities, so there is no way of knowing the status and knowledge of the writers, they may even have been Post Office doctors.

I propose that the slow and sporadic nature of the development of telegraphists' cramp resembles other occupational diseases at the end of the nineteenth century in some ways. In the case of illness and disease arising, for example, from lead and arsenic exposure, Bartrip records little or no interest in occupational lead poisoning following the first report of its incidence until later towards the end of the nineteenth century when interest rekindled.[309] Similarly with arsenic, although the time period was shorter, it was first raised as a concern in the 1840s, with further attention being directed to it in the 1860s.[310] Despite lack of interest from the Post Office Medical Service, by the end of the nineteenth century there was generally an increasing interest by the medical profession in occupational medicine and health at work. Bartrip suggests somewhat unfairly in my view, that those medical practitioners who promoted and campaigned for improved occupational health were not viewed as in the top rank of the medical profession.[311] I would challenge Bartrip's view because the two comprehensive textbooks written by John Arlidge in 1892 and Thomas Oliver in 1902 were extensive volumes and these two doctors were acknowledged to be experts in occupational medicine.[312] However only Oliver mentioned telegraphists' cramp as

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[309] See Bartrip, *The Home Office and the Dangerous Trades,* pp 59-61.
[310] Bartrip, *The Home Office and the Dangerous Trades,* pp 138-140.
[311] Bartrip, *The Home Office and the Dangerous Trades: Regulating Occupational Disease in Victorian and Edwardian Britain*, pp 1-7.
[312] John Arlidge was a consultant physician in Staffordshire who worked in the potteries and was interested in work related respiratory illnesses (e.g. phthisis). For a biography of his life and work see C Holdsworth, "Dr John Thomas Arlidge and Victorian Occupational Medicine", *Medical History,* 42, 1998, pp 458 - 475. Thomas Oliver was primarily a general physician who lectured at Newcastle University and had a strong interest in Occupational

part of a section on “occupation neuroses” containing a page on writers’ cramp and a paragraph on telegraphists’ cramp. He noted that there were “many cases recorded” although he does not elaborate on these.[313] As discussed earlier, although Arlidge described “local muscular spasms and palsies”, the lack of access to Post Office statistics prevented any discussion of telegraphists’ cramp.[314]

There is no evidence of any collective thinking about telegraphists’ cramp from either the medical profession or the telegraphists’ themselves. There clearly was some knowledge in circulation, judging by the letters to *The Telegraph Journal,* but this was disparate in nature and suggests no group thinking. However well informed the authors believed themselves to be, there is really no strong evidence pre-1900 to suggest their lay knowledge and views represented the telegraphists as a whole group. The telegraphists established and maintained a well-developed trade union structure and through this means facilitated disquiet with the Post Office primarily with regards to pay and job grades, although later health and working conditions started to emerge in connection with the Tweedmouth enquiry. I suggest that this positioning of health as part of working conditions would later facilitate relationships with government and employers when telegraphists’ cramp assumed much greater prevalence between 1900 and 1911 when the two major enquiries were held.

A Fleckian model cannot be constructed for this early history phase of the disease, although evidence suggests peer to peer lay knowledge circulating among the telegraphists as a group. I propose that this demonstrates peer support as well, so forming an embryonic thought collective, although only between a few interested people at this stage. As with writers’ cramp this information would prove useful at a later stage for medical professionals

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Medicine, especially the “Dangerous Trades” industries. He was also a Factory Inspector. See RI MacCallum, ‘Sir Thomas Oliver (1853-1942) and the Health of Antimony Workers’, *Vesalius IX,* 2003, Volume 1 pp 13-19.

[313] See Thomas Oliver, *Diseases of Occupation from the Legislative, Social and Medical Points of View.* (London: Methuen and Co, 1902), pp 361-362.

[314] See Arlidge *The Hygiene, Diseases and Mortality of Occupations*, pp 553-554.

when diagnosing the condition. I conclude that telegraphists' cramp is conspicuous in its absence and elusiveness, within the Post Office and its workplace health and industrial relations history, and from the general development of occupational medicine in Britain at the end of the nineteenth century.

4 The route to compensation for telegraphists' cramp

4.1 Introduction

The purpose of this chapter is to discuss the 1908 government Industrial Diseases Committee enquiry into telegraphists' cramp under three main themes. Firstly, I will examine the context and relevance of the successive Workmen's Compensation Acts (WCAs), particularly the 1906 Act that would eventually provide the legal framework against which telegraphists could claim compensation for contracting cramp through the use of the Morse key. Secondly, by examining archive evidence I will demonstrate that the 1908 enquiry was the culmination of protracted activism by the Postal Telegraph Clerks Association (PTCA) combined with medical evidence from the Post Office Deputy Medical Officer (Dr John Sinclair) both of which demonstrated to the Post Office that telegraphists' regimes and their use of the Morse key resulted in cramp symptoms. I propose that the PTCA activities which included assessment of their workplaces and work systems, and empirical data collected from these represent early attempts to adopt an ergonomic approach to resolving workplace environmental problems.[315] Through scrutiny and analysis of archive material I provide evidence of resistance from Post Office management to refute the PTCA claims. Thirdly, I examine the government enquiry, which scrutinised data collected from telegraphists who had contracted telegraphists' cramp during the course of their employment at the Post Office. The enquiry focused solely on the medical arguments and evidence presented in order to make the decision regarding compensation payments. The overall approach of the committee towards occupational diseases was part of the Liberal government's agenda for workplace and social reform, which included addressing workplace health issues.

[315] A broad definition of the science of ergonomics the study of the relationship between man and his working environment. For an introduction to present day ergonomics see https://www.ergonomics.org.uk/ last accessed 10/05/2019.

My analysis of the interactions between the government response to occupational disease, the telegraphists contracting cramp and Post Office management after the disease was scheduled as eligible for compensation has enabled me to develop the first stages of the two strand social-historical model. The 1908 enquiry was pivotal, because it considered telegraphists' cramp purely in terms of medical characteristics and within the sociopolitical framework of compensation for diseases contracted within the course of employment, and the first strand of my model (Stage 1) will reflect this. Similarly, the Fleckian mapping model used to demonstrate the second strand is based on a consideration of the groups involved in the compensation process for cramp at this stage in the lifecycle of the disease. By 1908 there was evidence of collective thinking emerging and distinct thought styles developing and based on this evidence I present proposals for the first esoteric and exoteric circles involving the PTCA, Post Office management, the Post Office Medical Service and the Industrial Diseases Committee.

4.2 Workmen's compensation

Rapid industrialisation in the 1870s resulted in more workers being employed by larger organisations. However, existing safety legislation did not make provision for the increasing numbers of the workforce who experienced accidents and ill health as a result of employment.[316] At this time, workers had no rights to seek damages as a result of work injuries and, whilst the Factory Act of 1844 permitted actions against employers for damages sustained by injured employees, these actions needed to be sanctioned by a factory inspector, and there was no guaranteed right of compensation even if the employee won the

[316] See P Bartrip and S Burman, *The Wounded Soldiers of Industry, Industrial Compensation Policy, 1833 -1897* (Oxford: Oxford University Press, 1983), pp 7-24.

case.[317] By the 1870s, government attitudes to injured workers began to change as a result of pressure from trades unions and middle-class reform groups who petitioned to government select committees and parliamentary bills, culminating in the passing of the Employers Liability Act in 1880.[318] This act did not automatically award compensation for injuries, and although employers were culpable for injuries or death at work, proving breach of statutory duty was required by employees or their families to win damages or compensation for loss of earnings.[319] At this time, many employers sought exemptions from both the Employers Liability and Factories Acts, with the mechanism of "contracting out" especially prevalent.[320] In 1893, a new Liberal government was in power and the Home Secretary proposed an amendment to the Employers Liability Act which would essentially permit "no fault" compensation for those injured in the workplace. [321] The proposal also called for compensation on an insurance basis with the advantage that employers could budget for insurance costs rather than unpredictable damages claims.[322] The first Workmen's Compensation Act (WCA) became law on July 1st, 1898 and included the concept of no fault accidents (unless misconduct could be proved). Not all workplaces were included however, factories, railways, mines, quarries, construction and its powered machinery were included; offices, shops and other premises and occupations were exempted as they were believed to be low risk working environments.[323] The passing of the act attracted social and professional comment and criticism and concerns were raised on issues such as the continuing financial

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[317] See Bartrip and Burman, *The Wounded Soldiers of Industry,* pp 154-163.
[318] Bartrip and Burman provide an authoritative account of this in *The Wounded Soldiers of Industry,* pp126-149.
[319] See McIvor, *A History of Work in Britain,* pp151-153.
[320] Note, "contracting out" in essence involved both employers and employees contributing to mutual insurance schemes to compensate the injured. Employees were often required to sign agreements to not sue their employers in the event of injury.
[321] The rationale, as paraphrased by Bartrip, was "if all employers were to be held liable for accidents over which they had no personal control, it was fair and logical that all victims who were not themselves liable should gain redress". See PWJ Bartrip, *Workmen's Compensation in Twentieth Century Britain, Law Policy and Social History* (Aldershot: Avebury Press, 1987), pp 8-9. In this new government the Prime Minister was William Gladstone and Home Secretary Herbert Asquith.
[322] See Bartrip, *Workmen's Compensation in Twentieth Century Britain,* pp 9-10.
[323] See Bartrip and Burman, *The Wounded Soldiers of Industry,* pp 201-206.

burdens on employers, and employers accepting accidents as part of normal work occurrences, with little effort directed towards prevention.[324]

The medical profession was also interested in the WCA and the implications of it for doctors. Many articles appeared in both *The Lancet* and *The British Medical Journal* between 1897 and 1900. For example, an editorial article published prior to the WCA taking effect commented:

> it places capital and labour in quite a new relation and is an indication of the part of the government that human limbs and life have money values, and that neither can be injured or destroyed without the employer compensating for the loss[325]

I argue that for most doctors, assigning a monetary value to the human body would certainly be a difficult construct to consider and implement when treating those affected by workplace injury and illness. In a further article *The British Medical Journal* voiced further comment, emphasising it was a "national measure to safeguard the working classes", although the article cautioned that as a mechanism to improve social welfare it must not "outrun the ability to fulfil", interpreted as a caution against the financial implications for industry.[326] The main role for doctors under the terms of the WCA was to act as medical referees advising the judiciary at compensation case proceedings. The WCA specified conditions of medical referee appointments and how these would be distributed across the county network and

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[324] For examples of published social criticism see, 'Workmen's Compensation', *National Observer and British Review of politics, economics, literature science and art,* May 8, 1897, *British Periodicals,* p168: 'Employers and the Workmen's Compensation Act' *Saturday Review of Politics, Economics, Literature science and art,* July 2, 1898; 86, 2227, *British Periodicals* p7; and M Wilson, 'Employers' Liability and Workmen's Compensation', *Westminster Review, February* 1898, Volume 149, British Periodicals, p194.

[325] See "The Workmen's Compensation Bill from a medical and social standpoint" *The British Medical Journal*, 1897, Volume 1 (1902) p1449.

[326] The "Workmen's Compensation Bill" *The British Medical Journal*, 1897, Volume 2 (1908) pp 229-230 and "Provisions of the Workmen's Compensation Act" *The British Medical Journal*, 1897, Volume 2 (1957) pp 44 -45.

pay scales and also named the approved doctors appointed.[327] This process was much discussed in *The Lancet* and *The British Medical Journal,* because doctors would perform a dual role in the assessment of injured workers by examination and also advising the judiciary. An initial assessment would be followed at periodic intervals by further examination of those receiving compensation payments, when the doctors would be required to issue certificates of examination to both the injured and their employers stating fitness or otherwise for work. The medical referees, therefore, were given both a professional diagnostic and judicial role for both stopping compensation payments (if a worker was certified as fit to return to work) and giving second opinions on workers referred from other doctors. As doctors quickly recognised, the question of distinguishing pre-existing disease from disability could be difficult and, as correspondence to *The Lancet* indicates, doctors suggested the 1897 WCA should be reformed.[328] The 1897 WCA (amended in 1900 to include agriculture workers) had deficiencies in provision apart from those identified by the medical profession, and after calls for extensions and modifications a Home Office Department Committee was appointed to investigate amendments and extensions to other classes of employment.[329]

By the time this Department Committee reported in late 1905, a general election had occurred and when the new Liberal government assumed power in 1906 one of the first actions undertaken was to introduce the 1906 WCA.[330] The important addition to earlier acts was to provide for workers who had contracted diseases over a time period, and to interpret

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[327] See "Workmen's Compensation Act 1897. Appointment of Medical Referees" *The British Medical Journal*, 1898, Volume 1 (1947) p 1088. For an example of lists of appointed medical referees see "Medical referees under the Workmen's Compensation Act", *The Lancet*, 1898, Volume 152 (3910) p340.
[328] See "The Workmen's Compensation Act: A circular letter medical referees", *The Lancet*, 1898, Volume 152 (3912) p 498; "The Workmen's Compensation Act: A circular letter medical referees", *The Lancet*, 1898, Volume 152 (3912) p498; Albert Benthall "The Workmen's Compensation Act, 1897", *The Lancet*, 1899, Volume 154 (3970: pp 903-904; Albert Benthall "The Workmen's Compensation Act, 1897", *The Lancet*, 1899, Volume 154 (3972) p1040; "The Workmen's Compensation Act" *The Lancet*, 1899, Volume 154 (3981) pp1685-1686 and Albert Benthall "The Workmen's Compensation Act, 1897", *The Lancet*, 1899, Volume 154 (3982) p1773.
[329]Some of the issues repeatedly raised by the trade unions were: inclusion of all trades, compensation from the day of injury, settlements for young people. For further details see Bartrip, *Workmen's Compensation in Twentieth Century Britain,* pp 39-47.
[330] See Bartrip, *Workmen's Compensation in Twentieth Century Britain,* pp 47 -54.

these as if they had been the outcome of a single accident event. I argue that this was significant as it acknowledged the contraction of occupational disease in the workplace and placed responsibility on employers for the health of their workforce. Specified work processes and resulting diseases which could be associated with these (six in total) were originally included as part of the 1906 Act.[331] However, before the 1906 WCA came into effect, the Home Secretary (Herbert Gladstone) appointed a committee to investigate which further industrial diseases should be added to the original six specified in the Third Schedule.[332] The committee set out three test criteria to identify whether a specified work disease would fall within the remit of the Act. These, which I define as test hypotheses were:

- Is the disease outside the category of diseases already included?
- Does it incapacitate from work for a period of more than one week?
- Is it so specific to the employment that causation of the disease or injury can be established in individual cases? [333]

The serious intent of the committee is demonstrated by their review of forty two diseases, undertaken at various locations in Britain between 1906 and 1908, where evidence was heard from medical experts and either those directly affected or their representatives. Between 1906 to 1907, one of the major outcomes of the review was that twelve more diseases were added to the Third Schedule of the WCA 1906, by virtue of an Order raised by the Home Office Secretary extending the provisions of the WCA resulting in a total of

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[331] These were added to the Third Schedule of the Workmen's Compensation Act 1906. The initial six diseases and processes were exposure to: arsenic, mercury, lead, phosphorus, the diseases anthrax (from working with animal skins and wool) and ancylostomiasis (a parasitic hookworm found in mud and dirt in mines)

[332] This committee would be known as the "Departmental Committee on Compensation for Industrial Diseases" and was comprised of: Herbert Samuel, secretary of state in the Home Office as chair, Professor Clifford Allbutt, professor of medicine at Cambridge University, Dr Thomas Legge, Medical Inspector of Factories, Henry Cunynghame, undersecretary of state at the Home Office and Frank Elliott of the Home Office as secretary to the committee.

[333] See the *Report of the Departmental Committee on Compensation for Industrial Diseases, Report,* (London: His Majesty's Stationary Office 1907).

eighteen diseases in the Third Schedule.[334] The consequence of that was that by the time the WCA came into effect on July 1st 1907, there were more diseases scheduled than the original six. However, the committee did not reach its conclusions in time for the July WCA enactment, and further work was required.[335] I suggest that this timing proved to be beneficial for the telegraphists in their pursuit of compensation. The findings of the committee's enquiries ran to three detailed reports: a summary report listed by substance and process and recommendation or not for inclusion in the Third Schedule; a separate report detailing minutes of evidence, appendices and index, and a second report in 1908.[336]

The creation of the Industrial Diseases Committee was part of the Liberal government's campaign to address the fate of members of the working classes who had been incapacitated by their employment in British industry. Through the Industrial Diseases Committee and the WCA requirements, the committee established state compensation as a solution to dealing with the problem of injuries in the workplace. This legislation was an attempt to raise living standards of those who might be otherwise forced to live in poverty because of incapacity to work. I argue that the compensation process also addressed the principle that a workforce should not be injured through trying to earn a wage, as well as engaging employers to take some financial responsibility for their injured employees. This ruling had the effect of socialising and politicising injuries and medical conditions, especially when certification of the disease was required for compensation claims and payments to be initiated. Telegraphists' cramp was no exception to this and came to act as a political object at the heart of the social relations between the telegraphists and the Post Office.

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[334] Herbert Gladstone's order took effect from May 22nd, 1907.

[335] Particular reference was made to bottlemakers' cataract. See the *Report of the Departmenal Committee on Compensation for Industrial Diseases, Report,* p12.

[336] See the *Report of the Departmental Committee on Compensation for Industrial Diseases Report,* Minutes of Evidence, Appendices, and Index, (London: His Majesty's Stationary Office 1907). This would later become known as the "first report".

I include a summary of the process by which miners' nystagmus became a compensatable disease because Post Office management used the Industrial Diseases committee interview transcript for miners' nystagmus as an evidence based exemplar to establish whether there was a case for telegraphists' cramp as a possible compensatable disease. Miners' nystagmus was one of the forty two diseases reviewed and categorised as one of four "eye diseases".[337] The committee's *modus operandi* for hearing evidence was based on the hearing location, therefore having a full discussion about a particular disease could be fragmented over several meetings and doctors called to present evidence were often asked about other occupational diseases. [338] That the committee always prioritised medical view and opinions is clearly demonstrated by their deliberations on miners' nystagmus. For example, when the committee visited Glasgow in January 1907, medical evidence was heard from a Dr Thomas Meighan.[339] His report focused on incapacity for work because of contracting miners' nystagmus and he had calibrated "three degrees of incapacity". Progression through these stages and how many workers might attract compensation should the disease be scheduled was discussed.[340] This resulted in the committee report concluding "that no matter what stage the nystagmus was when medical advice was sought, pit work should be entirely relinquished". A second conclusion was that symptoms were largely subjective (there were no objective medical tests) and there was no relation between "severity of disease and incapacity". Despite medical evidence being based on subjective symptoms, the association with work tasks was, in the committee's opinion, strong enough to be one of the critical factors for adding the disease to the Third Schedule. The other factor

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[337] The others were bottlemakers' cataract, injury from impact of metal fragments and, electric welding injuries (arc eye), although only bottlemakers' cataract was considered as having chronic health effects.

[338] For example, Dr Snell was asked about beat hand, a cellulitis of the hand miners experience, contracted through continual use of coal picks when hewing coal. These were completely outside his field of expertise as an eye surgeon.

[339] Dr Meighan was an eye surgeon at Glasgow Eye Infirmary. See "Hospitals affording facilities for clinical observations", *The Lancet*, 1906, Volume 168 (4331) p586.

[340] The "three degrees" were: "those slightly affected who could continue working underground, those who were affected by dizziness and have to abandon work underground and, those who were unable to go to the pit". See Dr Meighan's evidence, See the *Report of the Departmental Committee on Compensation for Industrial Diseases Report,* Minutes of Evidence, Appendices, and Index, pp159-161.

related to the consequential social aspect of an affected miner losing their livelihood as a result of abandoning work underground in a mine.[341] Figlio's theory on the scheduling of miners' nystagmus was defined in terms of an [occupational] illness that acted as a mediator of the social relations of labour and production.[342] He suggests that a set of medically diagnosed symptoms in an affected individual, in association with a defined labour process, triggered a series of defined social operations (medical, legal and administrative) resulting in scheduling of the disease and payment of compensation in place of wages. I would argue that if telegraphists' cramp is examined in the same way as miners' nystagmus, comparisons can be drawn. Telegraphists, if badly affected by cramp, also had to abandon their work and become reliant on compensation instead of earning a wage. I also propose that telegraphists' cramp as an occupational disease object also became a mediator of the social relations between the workers and their employer.

4.3 The case for compensation

The case for compensation of telegraphists injured by use of the Morse key was justified from three different sources: an external letter from a Liberal MP (John Robertson) to the Postmaster General (Sydney Buxton) which supported the PTCA evidence and claims; PTCA empirical data based on telegraphists' work practices and working environments; and the medical evidence provided by the Post Office Deputy Medical Officer (Dr John Sinclair). I will examine each of these three strands of evidence. I shall also explore the counter claims put forward by Post Office Management that challenged this, perhaps to avert what was seen as a risk of the disease being scrutinised by the government Industrial Diseases Committee, and liable to compensation payments being made.

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[341] See the *Report of the Departmental Committee on Compensation for Industrial Diseases,* Report, pp 9-10.
[342] See K Figlio, *How does Illness Mediate Social Relations? Workmen's Compensation and Medico Legal Practices 1890 - 1940* in P Wright and A Treacher A (eds) *The Problem of Medical Knowledge - Examining the Social Construction of Medicine (*Edinburgh, Edinburgh University Press, 1982) pp 174-224.

The first trigger for considering whether telegraphists' cramp could become a compensatable disease came from a source external to the Post Office. A letter was sent to the Postmaster General (Sydney Buxton) on 10th June 1907 from John Robertson a Newcastle MP who had championed and supported the PTCA arguments.[343] Robertson stated that he had consulted with other MPs "as to the advisability of making telegraphists' cramp come within the classes of trade diseases for which compensation should be obtainable" and that "most of them agreed with me that justice demands such an enactment".[344] This was a powerful statement, possibly motivated by the recent WCA 1906 legislation and amending Order to the Third Schedule of May 1907. A PTCA article published later in the Telegraph Chronicle (in March 1908) suggested Mr Robertson was an "old telegraphist", although Robertson did not provide this information in his letter to Buxton.[345] If this was the case, then much like Fulton in the 1880s, he would have had experience of the difficulties of work and continuous use of the Morse key for telegraphy. I propose that the significant difference between Fulton and Robertson is that Fulton focused on physiological issues surrounding the medical diagnosis of telegraphists' cramp using Morse key coding errors as evidence of contraction of the disease, whereas Robertson's concern was the social consequence of a telegraphist contracting the disease and the resulting potential for loss of employment; compensation payments for injury was therefore a solution for this. Robertson clearly expected Buxton and the Post Office to investigate further and to take action, as evident from the closing words of the letter "I trust the Department is disposed to take such action as will make it unnecessary for any of us to raise the matter in the House". A consideration of telegraphists' cramp as a

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[343] Sydney Buxton was Postmaster General from 1905 to 1910. John Robertson was a Liberal MP for Tyneside, Newcastle.

[344] *Letter from John Robertson to Sydney Buxton,* POST 30/3399, File I (June 10th, 1907), London: BT Archive. One impetus for the letter was that Sydney Buxton had clearly "made a decision" regarding a female telegraphist, presumably one of Robertson's constituents and suffering from telegraphists' cramp, although this was not stated and whether it was Buxton personally or one of his secretaries is not known.

[345] See "Telegraph Cramp", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (March 6th, 1908), Warwick: Modern Records Centre Archive.

possible candidate for compensation was a new perspective on occupational disease and I suggest that this proposal crossed a boundary from those workers engaged in high risk work environments (for example factory processes or mines) to those, like telegraphists, who would consider themselves as the professional classes who worked in offices or as public civil servants, where work environments had previously been considered as low risk in terms of injury and disease.

Robertson supported his letter with evidence in the form of an unsigned and undated PTCA document for Buxton's attention.[346] This was the first submission of the PTCA evidence to the Postmaster General.[347] The 1907 document opened with a strong and somewhat accusatory statement:

> The alarming increase in the number of cases of telegraphists' cramp, demands that some searching enquiry should be made into the causes and that earnest consideration be given to the possibilities of prevention and alleviation of the conditions which are producing such disastrous results. The physical and mental strain consequent upon the arduous and exacting duties of an expert operator, has been freely admitted, yet so far, no att[empt] has been made to deal with the question.

Examination of this paragraph highlights several important issues: firstly that means of prevention could be a possible solution, secondly, that someone, possibly in the PTCA had

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[346] The document (six pages) was not dated or signed so gave no clues to authorship. Robertson suggested this was something the PTCA was working on, although in a later article in *The Telegraph Chronicle*, the PTCA reported that Robertson had submitted it as a memorandum to Sydney Buxton, implying authorship. See "Telegraph Cramp", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (March 6th, 1908), Warwick: Modern Records Centre Archive.

[347] This document is clearly an embryonic version of a second document submitted as evidence to the Industrial Diseases Committee The paper copy is typewritten, but in a very fragile condition with large parts missing. Interestingly even the final version gave no clues to date of writing or author(s). See *Telegraph Cramp,* POST 30/3399, File I (June 10th, 1907), London: BT Archive.

recognised the strains of working as a telegraphist and thirdly, the perceived lack of action by their employers to resolve concerns.[348] These were not the sole observations – further concerns related the cause and effects of telegraphists' cramp in the context of the "magnitude of the Postal Telegraph Service and local [working] conditions". These included the number of years older telegraphists were required to perform manipulative duties, and how this group would be working under pressure and "harassing local conditions".[349] The work schedules known as the cycle system were viewed as "predisposing to the contraction [of the] ailment" as well as the receiving and transcribing message duties. [350] As a solution, the PTCA advocated a revision of the cycle system, whereby all telegraphists on the same grade should take equal turn at different jobs, in effect a job rotation system.[351] The PTCA document concluded that the Post Office had not done enough to inquire into the "distressing malady of telegraphists' cramp" and requested that the Post Office Medical Department should help in the redeployment of those affected and, should issue preventative measures to "deal with the disease", making the assumption they were familiar with the telegraphists' working conditions. The document demonstrated PTCA awareness of the prevalence of telegraphists' cramp and a complete lack of engagement or response from Post Office management in 1907. There is no evidence to indicate how the PTCA had collected data on prevalence or acquired knowledge about prevailing work conditions that led to its onset, but I argue that they had also adopted an early ergonomic approach to the recognition of the

[348] The PTCA were clearly aware of developments in America as they cited the Yetman transmitting typewriter as an alternative to the Morse key. Charles Yetman of Washington DC had devised a transmitting typewriter for use in telegraphy. These were advertised in telegraph journals as "a complete kit of tools for the telegraph operator – a single touch transmits a Morse signal for every letter and figure. No exhausting physical effort, no strain". See for example, *The Telegraph Age*, 1906, Vol 24: p xii.

[349] This was explained as an "emphatic protest" against the treatment of longer serving telegraphists who had contracted cramp and experienced consequent salary and pension reductions.

[350] The cycle system as described by the PTCA, involved placing the most experienced and longest serving telegraphists on the busiest and most important circuits and this resulted in excessive pressure and strain. Writer's cramp was also raised as a concern, primarily the environment provided (a flat surface) and having to write at variable speeds "controlled by the sending telegraphist"

[351] The PTCA also implied that Telegraph Service administrators could do more to help.

effects of interactions with new technology and practices on worker health.[352] The language used to explain this demonstrated frustration with the Post Office and supports the claim that telegraphists were treated unfairly, although in the context of the history of PTCA and Post Office industrial relations, I would suggest that there was a strong probability the Post Office would initially view such grievances about telegraphists' cramp simply as further complaints about working conditions.[353]

A second PTCA document was generated (date unknown) and this was submitted as evidence to the Industrial Diseases Committee. This had two strategic demands: to have telegraphists' cramp scheduled as an industrial disease and to have remedial measures adopted to prevent or mitigate against the disease.[354] Thus at an early stage the PTCA were making it clear to the Post Office that they believed injured telegraphists' should be compensated for their injuries sustained in the course of their employment as Morse key operators. This was supported by the provision of empirical data on the rate of transmission of Morse messages which the PTCA argued was a common work rate but which would show itself as strain on the hand muscles.[355] This insightful opening statement introduced both the potential risk factors for contracting the disease and mitigation measures that could be taken. Work rates were related to pay scales and operators could gain an increment by passing a

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[352] For example, there is no evidence that the PTCA asked for evidence through trade journals such as the Telegraph Chronicle. Until March 1908, the Telegraph Chronicle was more concerned with publishing articles regarding the outcomes of the Hobhouse Committee on pay and working conditions.

[353] The PTCA had always harboured concerns about pay scales and working conditions since the telegraph companies were nationalised in 1870, so had a history of raising grievances against their employer.

[354] Although little information had been made publicly available to most of the employed telegraphists, by the start of 1908, more publicity was given to the disease. A more comprehensive report was published in *The Telegraph Chronicle*, and the same report (updated) was sent to the Postmaster General and submitted as evidence to the Industrial Diseases committee in June 1908.The report first appeared in *The Telegraph Chronicle* entitled 'Telegraph Cramp' as part of a larger article titled 'A short criticism on the Select Committee on Post Office Servants' See *The Telegraph Chronicle,* MSS.148/PT/2/1/3 (February, 1908), Warwick: Modern Records Centre Archive. See also See "Telegraph Cramp", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (March 6th, 1908), Warwick: Modern Records Centre Archive. See *Letter to the Postmaster General from W Johnson,* and *Telegraph Cramp,* POST 30/3399, File III (June10th, 1908), London: BT Archive. At this time the PTCA were based in Liverpool.

[355] This was calculated an average 25 words per minute, and assuming five letter words was 375 signals per minute, which equated to an average of 22,500 signals per hour.

test where they demonstrated they could transmit 27 words per minute for 5 minutes.[356] The PTCA argued that accuracy was an important factor, especially when operators had to work on figures and how this imposed additional strain:

> It is not difficult then, to believe that an occupation which demands the unnatural and continued stress on a comparatively small portion of the human system, should in a number of years of constant application tend to produce both nervous and physical deterioration in the worker. Indeed, it is not unusual to find that a few years have been sufficient to play havoc with the arm and nervous system of a young operator.[357]

This was a perceptive statement which summarised concisely the effects of physical and mental strain on the operator, whilst acknowledging the effects of time exposure. I argue that this can be conceptualised as a recognition of the key ergonomic principles of force, repetition and posture as defining factors in the development of work related musculoskeletal disorders, although these would not be established by epidemiological studies until some eighty years later.[358] The PTCA also recognised an ageing workforce, as by 1908 the telegraphist population consisted of many staff aged over forty, with an excess of twenty five years manipulative work, a topic on the current occupational health agenda in Britain.[359] In 1908, pay and working conditions were of concern to the telegraphists and data on these were used by the PTCA to demonstrate that telegraphists with manipulation difficulties

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[356] This was implemented by the Post Office as an outcome of the 1906 Hobhouse Committee on Post Office Servants, although the PTCA claimed that Sydney Buxton later said this was not a demanding enough test.
[357] They cited the example of the Stock Exchange circuits where "the difference between a dot and a dash would convert a "0" into "1", a "9" into a "0", 1" into "2" etc".
[358] See for example, "Evidence for work relatedness for selected musculoskeletal disorders of the neck and limbs", in I Kuorinka and L Forcier (eds) *Work-Related Musculoskeletal Disorders (WMSDs): A Reference Book for Prevention* (London: Taylor and Francis, 1995), pp 17-138.
[359] The PTCA did not provide any data in support of this. For a present day perspective see, O Okunribido and T Wynn "Ageing and Work-related Musculoskeletal Disorders, a Review of Recent Literature", *HSE Research Report 799* (Norwich: HMSO 2010), pp1-41.

caused by cramp could suffer loss of earnings, increment stoppage and potential retirement from the service, interpreted as punishment for contracting a disease at work.[360] This was another facet of the strategic aim of getting the disease scheduled for compensation.

I propose the lay based assumptions of the PTCA can be interpreted as being aligned with Gower's definition of occupational neuroses. Their hypotheses on the causes of cramp were:

1. That the disease is primarily due to the continuous action of a particular set of muscles and is only indirectly and secondarily of a nervous nature.
2. That it is directly caused by the peculiar nature of a telegraphists' occupation and more particularly in signalling with the Morse key.[361]

The PTCA document also stated that if the Department had treated staff sympathetically in the early stages, those affected could have remained in employment and given valuable service to "warrant payment of a telegraphists wages".

The second part of the PTCA document furthered the compensation objective as it promoted a strategy for the Post Office, whereby resolution of telegraphists' cramp could be achieved if the Post Office recognised the disease as work related and paid compensation for loss of salary, increments and pension and also waived efficiency certificates.[362] The PTCA

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[360] The PTCA cited an increasing pressure on operators to send a higher number of messages per hour, which resulted in an increased workload from about sixteen messages an hour in 1893 to an average of twenty four (in 1907). In an Appendix to the report, the PTCA provided example cases of telegraphists who had "suffered through cramp or who have been threatened with loss of pay or pension".

[361] The document gave no clue as to how the information was collected, although at a later date when details presented to the Industrial Diseases Committee were published in *The Telegraph Chronicle*, it was stated that the evidence had been "prepared by the PTCA Executive Committee". See "Telegraph Cramp: Important Deputation to the Home Office", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (July 10th, 1908), Warwick: Modern Records Centre Archive.

[362] The Post Office demanded that operators underwent an annual certification process to indicate they were able to perform to the standard required by their pay grade. If they could not meet this standard, they did not get an increment. The PTCA reasoned that as the disease was contracted as a result of work, the certificate should be

suggested the prevalence of cramp was the result of poor Post Office procedures and equipment and the disease was largely preventable if these were improved. I suggest that the disease occurred as a mismatch between four component parts of the work system: the operators, design and use of equipment, work procedures and the wider work environment.[363] Many of the remedial measures were focused on work practices (see Figure 4-1). The PTCA considered the major elements of the workplace system (work processes, nature of the tasks, time duration and work environment), their effects on the operator, and how these could contribute to the development of telegraphists' cramp. In the present day, these are considered to be the main elements of an ergonomic evaluation of a work place. The PTCA had acquired knowledge in the identification of both contributing factors to the onset of cramp as well as remedial measures to help those with the condition. I would argue that they were much more well informed at this stage in the lifecycle of telegraphists' cramp than Post Office management and their Medical Officers with the exception of Dr John Sinclair.

The Post Office Chief Medical Officer, Dr Arthur Wilson, was dismissive of the content of the PTCA document.[364] He maintained that telegraphists' cramp was "primarily of cerebral origin" emanating from the cerebral cortex which controlled muscular movements with "sufferers being largely of a nervous temperament or a hereditary ability to suffer from nervous affections".[365] His only solution was prolonged rest away from telegraphy, after which there

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waived in cases of cramp certified by Post Office Medical Officers, and also pointed out that overall the only area where an operator might drop in their efficiency would be using the Morse key.

[363] The concept that a mismatch between a human and their work environment is the result of poor workplace design is a construct defined as "user centred design" that gained acceptance in the later twentieth century. For a summary account see S Pheasant, *Bodyspace - Anthropometry, Ergonomics and the Design of Work,* (London, Taylor and Francis, 2001), pp 12-14.

[364] *Letter from Dr Arthur Wilson to Post Office Secretary's Office*, POST 30/3399, File I (June 18th, 1907), London: BT Archive.

[365] Although this theory had been largely discounted by the medical profession by this time.

Remedial measure	PTCA justification
Abolition of the cycle system	Fairer distribution of workload
Six hours per day per operator per Morse circuit	Observed tendency for cramp less where this occurred though more varied work
Even distribution of non-manipulative duties	Would provide a more varied work pattern
More provision of Hughes machines	Use in busy offices would provide relief from Morse use and give staff opportunities to gain proficiency on different equipment
Encourage ambidexterity	Left handed signalling should be "recognised" and learners trained to send with both hands.
Improve Morse key construction	Poor construction impeded manipulation which resulted in operator discomfort.
Reducing overcrowding of circuits	Crowding in physical office space compromised operator discomfort
Sloping desks for transcribing (writing)	Alleviate writing on hard flat surfaces to make transcribing more comfortable
Sympathetic treatment of those with cramp	Keep injured operators employed. For those "mildly affected" make opportunities available in different Post Office departments, e.g. engineering, Clerical offices.

Figure 4-1 PTCA recommendations for remedial measures

was likely to be further breakdown so a change of employment would be needed for relief and recovery. Dr Wilson created summary data on of the prevalence of telegraphists' cramp to demonstrate a retirement rate of 0.12 and 0.07 per thousand employees of telegraphists' and writers' cramp respectively for the years 1898 to 1906. He concluded that these diseases were not a problem within the Post Office, but more of an issue of susceptibility of

individual telegraphists, thereby eliminating any association with work tasks and working conditions.

Simultaneously to Dr Wilson's data being issued, Dr Sinclair was collecting empirical data on the incidence of both cramps.[366] The data were classified by "manipulation difficulties through cramp" and subcategorised into "gender, work type, possibly cramp, doubtful cramp, and other affections". Of a total of 11,632 males and 7,460 females, there was an overall rate for all employees of 2.78% (525) affected. Manipulation problems were further subcategorised as "possibly cramp and doubtful cramp" and conflated into a category of "possibly officers affected with cramp" (424), which excluded 101 cases. Of the 424 reports, 87 (20.5%) had "total loss of manipulation", 282 (66.4%) had "partial loss" and 55 (12.9%) had "recovered". For ambidexterity, 28 (25.9%) had "cramp in both hands" and, for "nervous disorders", 64 (15%) were affected by cramp. For the remaining 101 cases (45 males and 56 females) different medical "labels" were assigned although there was no indication whether these were medically diagnosed cases. The highest returns were for "weak wrist": 16 females only, "strain of learning": 12 cases, 9 females, "rheumatism": 13 cases in total and "writers' cramp": 13 cases in total. Age and length of service relationships indicated a steady increase from the 1890s through to the period between 1901 to 1905, by which time they had almost doubled. The number of those first affected was 156 compared to other five year periods. [367] Age first affected was also delineated into five year bands, with the highest numbers being in the 21 to 25 (114 cases) and 26 to 30 (98 cases) age bands and a gradual tail off towards the older age groups, although not all respondents stated their age. As might have been expected, length of service was associated with the age first affected. I suggest

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[366] The data were collected by returns from telegraph surveyors across the network and evidence from the calculations suggests that it included most of the telegraphists employed in the Post Office from the 1880s to 1908. Dr Sinclair's evidence appeared as a series of typewritten tables. See POST 30/3399, File I (June 18th, 1907), London: BT Archive and also as hand written tables of data analysis, Tables 1 to 6, POST 30/3399, File II (no exact date, 1908), London: BT Archive. The latter were submitted as evidence to the Industrial Diseases Committee.

[367] Time period spanned the 1880s to 1908.

that this detailed level of analysis demonstrates Dr Sinclair's attempts to both establish the epidemiology of telegraphists' cramp as a work-related disease and also support the quest for compensation for injury.

4.3.1 Post Office management and telegraphists' cramp.

As a large government department organisation, the Post Office was sociopolitically powerful, clearly demonstrated by how they responded to reports about telegraphists' cramp. Indeed their responses effectively prevented the disease from gaining compensatable status. Post Office management was organised in a hierarchical structure; for example, the Postmaster General was supported by eight secretaries and a body of fifty four clerks at different job grades.[368] Communications were disseminated (mostly by written correspondence), through the hierarchical structure of secretaries and clerks and I suggest that the whole operation functioned as a self-sufficient social and administrative structure. Staff remained in post irrespective of the government in power or political affiliation of the Postmaster General, generally aspiring to progress through the ranks as career civil servants.[369] The organisational structure and mode of operation made it relatively easy for staff to selectively filter and interpret correspondence and make decisions often without involving the Postmaster General. This is certainly evident in the case of telegraphists' cramp, for example, the internal response to John Robertson's letter of 1907 when Post Office departments were asked to provide opinions on the number of telegraphists affected by cramp.[370] In one response from the Central Telegraph Office (CTO) controllers suggested

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[368] By comparison the Medical Department was small with six medical officers (including two part time) and five pharmacy staff. Other staff involved with telegraphists' cramp included the Central Telegraph Office (CTO), the staff branch and various surveyors and engineering staff nationally. See *Post Office Establishment Books,* (1907 and 1908*)*, London: Royal Mail Archive, for details of the staff involved and their job grades.

[369] This is evident from annual Post Office Establishment books, which give details of staff job ranks and career promotions.

[370] *Letter from Mr AH Norway (Postmaster General's Assistant Secretary) to CTO Controller,* POST 30/3399, File I (July 6th, 1907), London: BT Archive.

that “defective training” and “a certain style of gripping the Morse key” led to the disease and that “new learners should be taught to use both hands”.[371] The Post Office staff branch made further comment on data collected by the CTO, and archive evidence indicates that Post Office staff made lay interpretations and decisions on medical data.[372]

Post Office management requested from Dr Wilson clarification between occupational and other diseases, “for the purpose of the WCA”, leaving no doubt that they were aware of the implementation of the 1906 WCA in July 1907. The ensuing discussion in its use of the term personal idiosyncrasy, attempted to establish an individual’s pre-disposition to acquiring work-related illness. I suggest that Post Office management were trying to mitigate against telegraphists’ cramp being included as part of the Third Schedule of the WCA, by exploring personal susceptibility as a possible defence. [373] As part of this discussion, Post Office secretaries focused on miners’ nystagmus and queried why the Home Office Industrial Diseases Committee had awarded compensatable status for it which they then compared to telegraphists’ cramp.[374]

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[371] A summary of these letters, the series dated 9th to 11th July 1907 can be found in POST 30/3399, File I (July 6th, 1907), London: BT Archive and see response from the CTO controller *John Newlands to the Secretary (Mr Norway),* POST 30/3399, File I (July 15th, 1907), London: BT Archive

[372] These data were collated from returns sheets submitted by branches, which provided details of names, grades, salary, nature of disability, age of onset and, years of service and detailed in a summary memo written by Mr Paterson of the Post Office staff branch. It is not clear from the archives, whether this was directed to anyone or whether just a record. It is not clear whether this was the same data that Dr Sinclair was using. See *Memo from Mr S Paterson (signed SAP),* POST 30/3399, File I (August 22nd, 1907), London: BT Archive. The memo included data tables where there were a few cases labelled specifically as writers’ and telegraphists’ cramp, and comments on reported disability such as “weak arms”, “suffers from nervousness”, the latter applied only to female telegraphists.

[373] This letter is incomplete in the archive as if missing a front page. See *Memo from Mr H Babington-Smith,* POST 30/3399, File I (September 24th, 1907), London: BT Archive. The clue that it was sent to Dr Wilson can be found from a later request written by Leonard Raven (a Postmaster General’s First clerk) on 3rd October requesting that Dr Wilson reply to Mr Babington-Smith’s letter of 24th September. There is no indication that the Postmaster General was involved in these early discussions.

[374] See *Memo from Mr S Paterson (signed SAP),* POST 30/3399, File I (October 3rd, 1907), London: BT Archive. Of note are the additional handwritten comments on the document in the handwriting of Mr Leonard Raven, a junior Post Office clerk, which explored the specificity of a disease to a particular industrial job.

The case for compensation for telegraphists' cramp was strongly supported by Dr Sinclair who challenged the view from Post Office secretaries that susceptibility to it was based on personal idiosyncrasy.[375] Dr Sinclair's strategy to make the case for compensation for the telegraphists then focused on miners' nystagmus, whose inclusion in the Third Schedule of diseases was "of very great importance in connection with the question under consideration" (i.e. the possibility of telegraphists' cramp being included in the schedule) [376]. To reinforce his argument, Dr Sinclair aligned telegraphists' cramp with occupational diseases that were outside the scope of the WCA, but labelled as "fatigue spasm", which included writers', milkers' and tailors' cramps. He suggested that these were provoked by prolonged use of special movements demanded by the work, with the "objective sign" being disability for work limited to the movements required for these occupations. However, he also retained a view that those affected with telegraphists' cramp were of nervous temperament and that the ailment was of central origin, so did not completely dismiss ideas that personal constitution may be important. Dr Sinclair focused on the WCA premise that if a worker had to abandon his or her chosen employment (as in the case of miners' nystagmus) then he or she should be compensated. A telegraphist having to change work duties or be retired because of telegraphists' cramp was thus in the same situation. Upon this premise, he justified that this should be sufficient evidence to empower the Home Secretary to add further industrial diseases to the Third Schedule of the WCA and that telegraphists' cramp should be included. Dr Sinclair's report generated a chain of correspondence from the Postmaster General's Office.[377] This emanated from the junior clerks who were clearly of the opinion that the "probability of personal idiosyncrasy in cases of telegraphists' cramp" would preclude it from being added to the third schedule. They argued that miners' nystagmus was only

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[375] See *Memo from Dr John Sinclair,* POST 30/3399, File I (December16th, 1907), London: BT Archive.
[376] Dr Meighan's evidence in the *Report of the Departmental Committee on Compensation for Industrial Diseases Report,* Minutes of Evidence, Appendices, and Index, p160, paragraph 5081.
[377] Secretary Leonard Raven initiated the correspondence. See *Letter from Leonard Raven to the Secretaries* (Mr Norway and Mr Hoskyns-Abrahall), POST 30/3399, File I (December 16th, 1907), Letter from Mr Hoskyns-Abrahall to Leonard Raven, POST 30/3399, File I (December 17th, 1907), and *Letter from Mr Norway to Leonard Raven*, POST 30/3399, File I (December 17th, 1907), London: BT Archive..

scheduled because of doubt and disagreement among the medical experts, which was a distortion of the facts. The attribution of personal idiosyncrasy (i.e. some inherent predisposition) persisted with an assertion that if telegraphists' cramp was of low prevalence there would be no need to define it as an industrial disease, as the Industrial Diseases Committee had not included personal idiosyncrasy when considering scheduling. Post Office staff considered that telegraphists' cramp, whilst it was a work-related disease, occurred as a result of an individual predisposition to contracting it and that the Industrial Diseases Committee would probably also interpret it as an ailment attacking only those with a personal idiosyncrasy. [378] The junior clerk's solution was that "personal discussion" at the Home Office could avoid the disease being examined by the Industrial Diseases Committee and thus keep it as low profile as possible.

Despite all the speculative exchanges between the Post Office clerks and secretaries, there is no archive evidence to suggest that the Postmaster General was aware of the telegraphists' cramp problems until February 1908, when he received a document from one of the secretaries. This contained details from both the PTCA reports and Dr Sinclair's findings and was presented in an apparent attempt to discredit and distort the evidence presented. [379] I suggest that the intention was to mislead the Postmaster General. There are variations in the data presented, for example the lower prevalence rate was reported: 1% was quoted instead of Dr Sinclair's 2.78%.[380] The information was used to claim that there were no reasons to schedule telegraphists' cramp. The report advocated that the Post Office Medical Officers needed to be stricter in pre-employment medical examinations for prospective telegraphists with those showing "nervous disposition" being rejected. It was

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[378] *Letter from Mr Norway to Mr Babington-Smith,* POST 30/3399, File I (December 24th, 1907), London: BT Archive.

[379] See *Report to Postmaster General,* A F King*,* POST 30/3399, File I (February 24th, 1908), London: BT Archive. King commented on the PTCA opinions of causation, qualified by strong statements that the disease was of 'cerebral origin' with inherent weakness of the nerve cells manifested as cramp and, that affected officers "show marked neurotic tendencies in other directions" (i.e. predisposition).

[380] This was in fact the rate only in CTO and based on Newland's reported thirty-four cases.

suggested that Post Office Medical Officers adopt a watchful regime for early signs and symptoms of telegraphists' cramp with a time limitation set.[381] The question of alternative employment for those affected was raised, especially for older telegraphists. Suggested options for those unable to continue as telegraphists were to transfer to postal duties or being pensioned off, both of which options would have had implications for income. This medical surveillance approach was proposed as a plan to enable the Post Office to deal with cramp and contain it, although there is no evidence to suggest that it had been discussed with anyone in the Post Office Medical Department.

Sydney Buxton was a Liberal politician, who probably was supportive of the government's social welfare improvement strategies, including the desire to improve the conditions of the working classes. He disagreed with some of the procedure suggested by his secretary and believed it "a matter of justice" that the Post Office should seek the Home Office position on whether telegraphists' cramp would be likely to be scheduled as an occupational disease. [382] He wished to ascertain the government (Home Office) opinion and may also have wanted to protect the Post Office from any disrepute that could arise from any suggestions that telegraphists' cramp had been concealed from public view. His preferred course of action was cautious, and he suggested a personal visit by one of his secretaries to the Home Office to discuss how best to approach the issue.[383] Perhaps by coincidence, the MP John Robertson wrote to Postmaster General Buxton again in March asking for a response to his earlier letter as he had waited some nine months for a response. This time Buxton personally replied stating that telegraphists' cramp was being given "careful attention".[384] Buxton's view

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[381] The process or diagnostic test the Medical Officers should use was not discussed, although the Chief Medical officer (Dr Wilson) would be consulted. The suggested time limit was three to six months, "after which officers showing no improvements or having relapses should be assumed to be permanently unfit for manipulative work". How the suggested time period originated or where from was not referred to.

[382] See *Memo from Sydney Buxton,* POST 30/3399, File I (February 28th, 1908), London: BT Archive.

[383] This was delegated to a junior secretary (Leonard Raven), clearly because it was deemed trivial.

[384] See *Letter from John Robertson to Sydney Buxton,* and *Response from Sydney Buxton,* POST 30/3399, File I (March 3rd and March 4th, 1908), London: BT Archive. Buxtons' response was also printed in *The Telegraph*

on telegraphists' cramp and its potential scheduling clearly differed to those of his administrative staff who through their views and discussions had developed a collective view of telegraphists' cramp as a trivial and personal susceptibility problem that the PTCA were using as a bargaining mechanism for improved pay and working conditions. From the archive materials, there is a sense that the administrative staff attempted to discredit the PTCA at every opportunity. Many of the secretaries had previous experience of interactions with the PTCA on the Post Office pay and working conditions inquiries.[385]

The outcome of discussion with the Home Office left the Post Office in no doubt that they would have to submit telegraphists' cramp to Herbert Samuel's Industrial Diseases Committee for scrutiny.[386] Samuel's main point was that if the Post Office or their staff made representations to the Home Office, then the committee would want to hear medical evidence from both the employer and the employees and that it was "extremely likely" that scheduling was possible, even allowing for individual predisposition. This response was not the desired outcome the Post Office were hoping for, and that now the Home Office were aware, there was little choice but to set in motion actions that would result in telegraphists' cramp being considered as an industrial disease.[387] All the previous Industrial Diseases hearings had involved industrial processes and mainly factory workers and telegraphists' cramp presented a different and new facet of occupational disease, that of professional classes including government civil servants seeking compensation. At this stage, the Post Office adopted a corporate view that "the existence of the disease is beyond question" and

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Chronicle, See "Telegraph Cramp", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (March 20th, 1908), Warwick: Modern Records Centre Archive.

[385] For example, in the commentaries printed about the Hobhouse committee, secretary King had been publicly singled out by the PTCA as being obstructive and unhelpful. See the various articles relating to the Hobhouse committee in *The Telegraph Chronicle* 1907 and 1908 series, MSS.135/EU/5/10/27 and MSS.135/EU/5/10/28, Warwick: Modern Records Centre Archive.

[386] *See Report from L Raven,* POST 30/3399, File I (March 10th, 1908), London: BT Archive.

[387] In the prevailing political climate, the general mood of the Home Office and Samuels' committee was sympathetic to any industrial disease or work process that would result in disease and poor health outcomes. There was also willingness to listen to any party coming forward expressing concern about the health effects of work.

that the Postmaster General would provide relevant information to the committee.[388] Dr Sinclair was the key medical witness to attend, and whilst Buxton appeared supportive of the telegraphists he did not suggest any other witnesses to attend on behalf of the Post Office.[389] I argue that the main reason for this is that he viewed telegraphists' cramp purely within the medical domain. Even though Dr Sinclair was to attend the hearing as a key witness, the data he had collected was not submitted directly and in its original format to the Industrial Diseases Committee, but via the Postmaster General's office where an accompanying interpretive narrative was added.[390] Although the data were scrutinised systematically, there were further attempts to downplay the existence of telegraphists' cramp. As an example, when interpreting the numbers affected by manipulation difficulties Post Office secretary King wrote:

> it was somewhat higher than expected in view of the experience at the Central Telegraph Office, the overall number was very small (two and three quarter percent), and included 101 cases where it can be stated with some certainty that these are not affected by cramp in the true sense.[391]

King also proposed that if a more exhaustive enquiry was made, many of the remaining 424 cases would be found not to be true cramp, but one of the numerous diseases liable to be mistaken for it. This was a judgemental statement supported with no medical evidence. In a discussion on ambidexterity, the point was made that telegraphists with cramp could learn to

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[388] These requirements would be details for the Post Office to provide details of witnesses and evidence (particularly medical view) required. See *Letter from A F King to the Home Office* and, *Letter from Frank Elliott, Secretary to the WCA Committee,* POST 30/3399, File V (March 17th and May 9th, 1908), London: BT Archive. In parallel with this, Frank Elliott also communicated with the PTCA to request the same information.

[389] This is all evident from the various correspondence between the Post Office Secretaries, Buxton, Dr Wilson and the Home Office. See for example: See *Letter from L Raven to the Home Office, Letter from Dr Wilson to L Raven,* POST 30/3399, File V (May 20th, May 27th, May 28th 1908), London: BT Archive.

[390] See *Memo to Postmaster General from his secretary A F King,* POST 30/3399, File IV (June10th, 1908), London: BT Archive.

[391] While it is true that Dr Sinclair did exclude these cases, there were several with writer's cramp and tenosynovitis in this group, which could have been the outcome of repetitive Morse Key use.

send with their uninjured hand, and whilst there were those who developed cramp in both hand, the numbers were less than expected. This completely excluded the 25.9% rate that Dr Sinclair had reported.[392] Similar speculation and distortion appears with alternative suggestions proffered to explain the data. The PTCA evidence was included with the comment from secretary King that "it appears to contain a good deal of matter which is scarcely relevant". Buxton's first (handwritten) comment on the memo challenged this: "some of the PTCA suggestions are useful and practical and others are worth considering".[393] As Dr Sinclair was the sole witness appearing before the committee, his data and the interpretative memo were the only documents submitted by the Post Office prior to the committee hearing, although while at the hearing Dr Sinclair provided his own additional information.[394]

4.4 The Committee proceedings

The Industrial Diseases Committee, heard the case for telegraphists' cramp on a single day (June 15th 1908).[395] Dr Sinclair presented his opinions on behalf of the Post Office Medical Department (and in the absence of any staff from the Postmaster General's office also represented Post Office Management), Dr Hale-White, (a medical doctor) appeared on behalf of the PTCA, and PTCA committee representatives also gave their views. The process taken by the Industrial Diseases Committee at the hearing for telegraphists' cramp was no different in approach to the other diseases they had reviewed. The whole purpose of the Committee was to examine occupational diseases in the context of awarding damages for injury therefore their primary focus was on examination of the medical evidence in an

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[392] Of the 424 cases Dr Sinclair reported, 28 (25.9%) had "cramp in both hands".

[393] See hand written note from Sydney Buxton to A F King, POST 30/3399, File IV (June10th, 1908), London: BT Archive.

[394] Dr Sinclair handed out paper copies of the Morse code symbols for the alphabet and numbers. He also provided diagrams which described the optimum working hand posture for using the Morse key, along with a horizontal forearm and seat at a suitable height.

[395] They were sitting to hear glassworkers' cataract, prior to reviewing the case for telegraphists' cramp. See the *Second Report of the Departmental Committee on Compensation for Industrial Diseases 1908*, Minutes of Evidence and Appendix (London: His Majesty's Stationary Office 1908), pp 28 -33.

effort to determine likely causality of the disease and to link this to workplace tasks and activities. Information on a possible link between workplace tasks and activities was supported by testimonies of the workforce who were represented by the PTCA, their trade union, that I would define as secondary information. The Committee used a triangulation strategy with each witness being asked, depending on the subject, similar or the same questions. Herbert Samuel, as chairman, was clearly well briefed and led the questions with the medical input provided by Professor Allbutt and Dr Legge.[396] The discussion focused mainly on medical diagnosis and opinion and, the causation of telegraphists' cramp from use of the Morse key. The PTCA were mainly cross examined on interactions between the telegraphist and their work technology.

4.4.1 Evidence considered

The medical evidence was heard first. The questioning focused on the life cycle of telegraphists' cramp, the empirical data, the telegraphists' work environment, Morse key teaching methods, and, the role of Post Office medical staff. Dr Sinclair firstly described cramp as an occupational neurosis, to present his firm belief from the outset, although he acknowledged that nervous temperament was important.[397] Diagrams and Morse codes charts provided to the committee were used to support a description of signs and symptoms, identifying coding errors, illegible and jerky messages and imperfect message spacing as the outcome of the "fatigue spasm" characteristic of the disability limited to the specific movements required to operate the Morse key. Thus, scrutiny of Morse output tape would provide sufficient paper evidence of sending disability and thus telegraphists' cramp, as proposed by Fulton's theory of coding errors in 1884. I suggest that Dr Sinclair's strategy to

[396] Professor Clifford Allbutt was a professor of medicine at Cambridge University and Dr Thomas Legge, government Medical Inspector of Factories.
[397] Dr Sinclair quoted Gower's points about occupational neuroses being diagnosed in those who exhibit no other nervous symptoms, but who maybe were subjects of a nervous temperament.

associate the signs and symptoms of cramp with prolonged use of the Morse key, supported by his evidence was fundamental to the decision making process about whether to schedule telegraphists' cramp. The Morse output tape with coding errors and illegible messages provided additional visible information that a telegraphist was suffering manipulation difficulties and if a telegraphist reported symptoms, this could also be used as part of the diagnostic process which would distinguish telegraphists' cramp from neurasthenia, rheumatism and neuritis. A further point of diagnostic distinction was that those with cramp possessed full hand strength. Dr Sinclair believed that this disease was unique to the Post Office, that Post Office Medical Officers should be able to scrutinise cases in more depth, and that the term should be understood within the Post Office. He also suggested (at Samuel's prompt) that further diagnostic definition would be required if telegraphists' cramp were added to the WCA, and "outside medical authorities" might be involved.

The importance of medical examinations prior to starting telegraph work were raised by Professor Allbutt in the context of personal idiosyncrasy as a possible contributory cause. Although these already existed in the Post Office, medical decisions on candidates made by their doctors could be overruled by non-medical civil servants. Associated with this was some discussion about the role of Post Office Medical Officers as factory certifying surgeons, with a role for the central Medical Department as a point of reference in doubtful cases as well as sending advisory information to their staff. The prevalence data were examined, and the panel clearly disagreed with the Post Office management's interpretation that this was "small". The theme of the questions then examined the interaction of the operators with the Morse keys and the work environment, specifically the psychological effects of work rates, work pressures and the resulting mental strain. Dr Sinclair proposed that physical and mental exhaustion was the precursor to cramp exacerbated by the Post Office working method known as the "cycle system". Strain and work rate was contextualised by the Post

Office in terms of operator efficiency.[398] Further general discussion examined the merits of task rotation, telegraphist seat height, Morse key design and the benefits of alternative telegraphic apparatus.[399] The Committee accepted the Morse key as the definitive causation factor for telegraphists' cramp which led to the proposal that telegraphists contracting cramp by using Morse key should be defined as "Morse operators" with the medical diagnosis being defined and confirmed by illegible and jerky Morse code transmission, evidenced by physical hard copy outputs. In conjunction with observed and reported medical symptoms, this provided a technological and multifactorial definition of telegraphists' cramp.

The Committee questioned the PTCA's medical expert in the context of the occupational specificity and the prevalence of telegraphists' cramp.[400] Dr Hale-White's view was that this was a distinct condition, but because it was rare among the general population, diagnosis could be missed unless the doctor knew the person's occupation. There was some further discussion about this. After a review of Dr Sinclair's data tables and diagnosis, Dr Hale-White concluded that adjudication on diagnosis by Post Office Medical Officers would be the best solution.[401] The factors unique to telegraphists' cramp were discussed and Dr Hale-White suggested that the work tasks and equipment involved were key indicators of the disease.[402] Dr Hale-White's view of the Morse Key was explicit:

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[398] The 'cycle system' involved work being allocated according to the importance and traffic loading of circuits and staffed by senior telegraphists, who of course also had the longest years' service. When operators left the telegraph training school, they attained 20 words Morse transmission per minute. By the time they were in charge of a circuit, the Post Office demanded 25 words per minute.

[399] For example, the Hughes and Yetman machines, with keyboard and typewriter interfaces and where the diversity of muscular movements required to operate these reduced the risk of cramp.

[400] Dr Hale-White was a senior physician at Guy's Hospital, London, consulted by the PTCA, who had seen many cases of writers' cramp. He stated he had "seen many Post Office people" with writers' cramp, so had some experience of the Post Office as an employer.

[401] This was based on his experience of writers' cramp being more easily diagnosed by doctors because of its higher prevalence in the workplace.

[402] This aligned with Dr Sinclair's view that along with coding errors from Morse key use, a distinctive diagnosis of telegraphists' cramp could be made.

> from a medical viewpoint it would be difficult to conceive of an apparatus that would be more likely to lead to the disease in question, because there is only one key to be pushed using one finger and the smallest muscles of the hand all of the time.

He was clearly not impressed by the Morse key as the prime telegraphic instrument, although he may have held a prejudice as he was representing the PTCA. Dr Hale-White agreed with Dr Sinclair's view on the use of alternative telegraphic apparatus for those affected by telegraphists' cramp.

The PTCA were represented by Mr Belderson (PTCA parliamentary secretary), Mr Davis and Mr Johnson (PTCA executive committee members). The Committee interviews with the PTCA focused on reasons for compensation, pay, work procedures and equipment rather than the reported medical signs and symptoms and diagnosis although the frequency of the disease among telegraphists was addressed in the opening questions. The PTCA described that whilst the process varied at different offices, generally the telegraph supervisors reported cases to the Medical Officer as "matters of inefficiency" rather than medical problems. The consequences of this being classified as an inefficiency would be a stoppage of an increment, reduction in salary or consideration of pension, a situation the PTCA wanted to prevent. The difficulty of distinguishing telegraphists' cramp from general work inefficiency problems was debated, although feigning cramp to hide inefficiency was not thought likely. Interestingly the Committee asked the PTCA for their views on the issue of Post Office Medical Officers assuming the role of required certifying surgeon should the disease be scheduled.[403] The PTCA agreed that Post Office doctors should initially decide on the diagnosis of telegraphists' cramp, with the safeguard of an appeal to a medical referee, to

[403] At this point Herbert Samuel then explained the purposes of the WCA to provide compensation for scheduled diseases and the involvement of the district Factory Certifying Surgeon in issuing certificates.

remove any possible Post Office influence, especially once the disease was recognised in the WCA as an occupational disease.

The PTCA argued, in accordance with their strategic aim for compensation, that telegraphists would only claim compensation if there was no alternative. They believed that allocation of alternative duties for younger telegraphists (to avoid pension decrements) was a realistic solution and concurred with Dr Sinclair's opinion that alternatives to the Morse key (such as the Hughes machines) were suitable, as in their knowledge there had been no Hughes operators who had experienced cramp symptoms. The PTCA were concerned about telegraphists being "pensioned off" before they were entitled to a pension and their experience was that these telegraphists were not offered alternative employment within the Post Office, although this conflicted with Dr Sinclair's view that the Post Office transferred those affected to other roles. [404] The committee questioned the PTCA on the design and construction of the Morse key. Mr Johnson representing the PTCA described the Morse key technology and how spring contacts on the Morse key could result in a "jar to the hand" depending on the construction of the contact spring. He expressed concern about the mismatch between the Post Office Works Departments' goal of achieving a perfect electrical signal and the muscular comfort of the operator using the key in their daily work routines. As part of this discussion on operator-equipment interaction, work pace and work rates were discussed. The Post Office defined sending rates in terms of minimum words per minute and as confirmed by Mr Johnson and Mr Belderson, this affected transcription of received messages. The details of keying technique and training were also raised and whether might this influence how telegraphists affected by cramp would use their left hands alternately with their right. The PTCA explained that training process was a two year staged process, whereby learners had to achieve a certain transmission rate before being appointed to work

[404] Post Office employment conditions were that employees of less than 10 years' service did not receive a pension. The PTCA had access to a much larger network of telegraphists through their branches than Dr Sinclair, so probably had greater knowledge of Post Office staff management practices.

in the telegraph room which included a medical examination at the end of their first year before appointment was made. They suggested that those with more than five years (full service) might be susceptible to cramp, and this supported Dr Sinclair's statistics that cramp affected those telegraphists with longer service.[405]

In the conclusion to their evidence, the PTCA restated their ambition to get telegraphists' cramp scheduled as a disease of occupation. This would act as a mechanism to induce the Post Office to adopt remedial measures such as reorganisation of the work and introduction of alternative telegraph machines.[406] Whilst this might be interpreted as protecting jobs, this was a good solution from the PTCA perspective to keeping otherwise fit and experienced members of the workforce in employment rather than being pensioned off at an early age. Work variation could also alleviate telegraphists' cramp because it would reduce the strain caused by constant sending. The increasing age of experienced telegraphists, increasing telegraphic traffic, and fewer promotion opportunities were all issues that promoted the tendency for cramp. One of the PTCA's strategies was the adoption of preventive or remedial measures with compensation awarded for those already injured by the disease. However, in 1908, the main objective of the Industrial Diseases Committee was assessment of occupational diseases for compensation.

[405] Mr Davis and Mr Belderson were not aware of any learners contracting cramp, tiredness was an issue, but they stressed this was not cramp. Some cases of cramp had occurred in hardworking experienced telegraphists especially those working on news wires.

[406] He argued that this would provide those who were unable to use the Morse key with the ability to be just as efficient on other machines as telegraphists.

4.4.2 Committee recommendations and implementation

In November 1908, the Postmaster General was formally notified by the Home Office that the Industrial Diseases Committee had recommended the inclusion of telegraphists' cramp within the WCA.[407] The schedule indicated "use of telegraphic instruments" as the causation of telegraphists' cramp with no specific reference to the Morse key. The Home Office stated their position with regard to authorising the Post Office Medical Officers as certifying surgeons.[408] The committee findings were summarised in a supplementary report. The medical signs and symptoms and the outcomes: "evidence of the malady, recorded on the Morse slip" were based on medical evidence presented. The work relatedness and therefore scheduling was also justified:

> that the disease should be considered specific to the employment is beyond question and we are of the opinion that it should be added to the schedule as a subject for compensation.

It also contextually defined "workman" (for the purposes of the WCA) as someone "in the employment of the Postmaster General", so there could be no doubt as to applicability to the telegraphists.[409] The Postmaster General received this information as an "interpretative"

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[407] The committee report was enclosed as well as a draft of the accompanying Order See letter and attachments from the Home Office to the Secretary of the Post Office. *Letter from E Blackwell to the Post Office Secretary*, POST 30/3399, File VIII (November 2nd, 1908), London: BT Archive.

[408] A clause had been inserted in the Order to overcome the difficulties (and presumably the workload), with the Home Secretary approving individual medical officers and they issued instructions on medical officer payments that the Post Office were required to comply with.

[409] It is evident that the PTCA were informed simultaneously as *The Telegraph Chronicle* published details of the scheduling decision, using most of the same wording as the letter to the Postmaster General including the PTCA agreement about the use of Post Office Medical Officers as certifying surgeons. See "Telegraph Cramp: Scheduled as Disease of Occupation", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (November 27thth, 1908), Warwick: Modern Records Centre Archive.

memo from his secretary.[410] The archive evidence demonstrates that Sydney Buxton's initial concerns were financial: the costs of the enquiry to the Post Office and a demand that the Home Office confirm the "legal financial position" of an officer contracting cramp, to enable the Post Office to take a position. My interpretation of the evidence is that perhaps the Post Office believed that the scheduling of cramp in the WCA was somehow optional for them to comply with. The Home Office response would leave them in no doubt: they confirmed the Order, advised that the amended regulations would be presented to parliament and, advised the Post Office to brief the Post Office Medical Officers on the new requirements.[411] In response, Post Office management took the minimal action of issuing an extremely short (draft) circular which announced that the WCA had been extended to include telegraphists' cramp and that a further announcement would detail the process to be followed.[412]

Scheduling of the disease prompted discussion in the Post Office of the compensation process for injured telegraphists and their eligibility. Clarification came from the Home Office stating that the Order could not be enforced retrospectively, so that cases where disablement occurred prior to the date of the Order would not be compensated.[413] Buxton's "legal financial" concern of how to relate medical diagnosis of telegraphists' cramp to financial compensation was negotiated between the Postmaster General's secretary and the government treasury department.[414] There was already a pre-existing scale used by certifying surgeons in the injury certification: "slightly impaired, impaired, materially impaired, and totally destroyed" and the Post Office believed their Medical Officers would adopt this

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[410] See *Memo from A F King to the Postmaster General,* POST 30/3399, File VIII (November 16th, 1908), London: BT Archive.
[411] See *Letter from H Cunynghame to the Postmaster General*, POST 30/3399, File IX (December 3rd, 1908), London: BT Archive.
[412] The circular was released on December 15th, 1908.
[413] The one exception to this would be a case where a telegraphist had contracted cramp, recovered, returned to work and then became incapacitated again after the date of the Order. See correspondence between Raven and R Bannantyne of the Home Office, POST 30/3399, File IX (Letters dated December 10th and 12th, 1908), London: BT Archive.
[414] See *Memo from A F King to the Postmaster General,* POST 30/3399, File X (January 7th, 1909), London: BT Archive.

regime. Correspondence indicates that Post Office management believed the Treasury would most probably classify an officer retired on telegraphists' cramp as "slightly impaired", although the final decision would be dependent on the medical certificate. Despite the legislation, archive evidence reveals that both the Post Office and the Treasury were keen to avoid large compensation payments.[415] As a comment in the correspondence to the Treasury demonstrates, Post Office management appeared at this stage to reject the instigation of compensation payments:

> the inclusion of the disease under the WCA does not imply that persons affected are to suffer no loss whatsoever, the Act being based broadly speaking on the principle that the loss shall be shared between the workman and the employer.

This suggests that Post Office management still retained an attitude of blame on the part of the telegraphists, hardly the spirit of "no fault injury" compensation that the WCA was intended to deliver. For the Post Office the importance of the medical benefits of early detection of cramp was primarily a device to ensure minimising future compensation payments from the Post Office. There is some evidence of a hardening attitude that those affected with cramp after a few years' service should be "dispensed of". Post Office management were also aware that application of the Act to only newly diagnosed cases, with the date of determination being the date the telegraphists was finally removed from manipulative duties, would lead to dissatisfaction among telegraphists and deemed this "an accurate view" to ensure legal compliance, although whose view was not clear. As an exemplar of how the process would work in practice, details of nine recent cases of

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[415] King explained to the Postmaster General the complex algorithms for calculating payments provided by the Treasury, which also specified further conditions of payment, for example if the injured party could find other work to telegraphy, the payments would be reduced or even zero. Similar conditions were to be applied to those working in the Post office in other role at reduced pay. Those at the pay scale maximum would not receive any compensation (unless they were under twenty one), and those offered other employment on the same scale would have no claim.

telegraphists' cramp were presented to the Postmaster General by the Post Office Secretary, with the claim that only three would be eligible for compensation as the rest predated scheduling of the disease. These cases included telegraphists transferred to postal duties where they had lost seniority of rank, but the secretary argued that loss of earnings would be offset by compensation payments.[416] His rationale was that it would be in an officer's best interest to transfer to a lower grade rather than being pensioned off and it could not be reasonable to move a telegraphist to a rank senior to that of longer serving postal officers. This was justified using an invented concept of "work value" of someone transferred to a new role treating the transition as if it were capable of empirical measurement.[417] I argue that these exchanges between the Post Office secretaries, the Treasury and the Postmaster General demonstrate that although there was now a legal requirement for the Post Office and Treasury to pay compensation in the event of injury, the criteria to be fulfilled for a worker to gain compensation were complex. The origin of these is obscure, they seem to have been contrived independently of the Post Office Medical Department by the Post Office secretaries and imposed on the Medical Officers as there is no evidence to support any discussion between Drs Wilson and Sinclair, the PTCA and the Post Office management. At this point the PTCA may have felt that they had won a rather pyrrhic victory.

The archive documents indicate that the Post Office Medical Department was eventually informed of the scheduling of telegraphists' cramp. These documents confirmed the role of Post Office Medical Officers as certifying surgeons and requested an explanatory document on telegraphists' cramp from the Medical Officers to be issued as a Post Office circular.[418] A comprehensive document produced (by Dr Sinclair) included occurrence, symptoms,

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[416] See *Memo from A F King to the Postmaster General,* POST 30/3399, File X (January 30th, 1909), London: BT Archive.

[417] King's memo was also circulated to the "Staff Department" and the "Discipline Section" of the Post Office who duly responded with a "noted". A hand written annotation (author unknown) advises that "the Treasury would not of course entertain the idea of monetary compensation for loss of seniority".

[418] See *Letter from Raven to Dr Wilson,* POST 30/3400, File XII (December 19th, 1908), London: BT Archive.

examination of the hand and arm, differential diagnosis and treatment. It focused on the key indicators of telegraphists' cramp and described the condition as a condition "affecting operators who use the Morse key" with no comment on prevalence of the condition and suggested the Morse slip output indicated "final evidence of [the] malady". Symptoms were stated as "discomfort at work or pain not confined to one set of muscles" which was a broad definition, but one that could be used by doctors to detect the early onset of telegraphists' cramp. Physical examination could help effect a differential diagnosis to exclude other diseases and illnesses. A guidance process was provided that could screen out other industrial diseases, muscular strains, weaknesses due to "organic disease", tiredness and neurasthenia. The key distinguishing factor, however, would be that the symptoms occurred whilst performing telegraphy using the Morse key, so there was a causal link to the diagnostic procedure. Recommended treatment was simple - six months rest from manipulation duties with medical review at three months of all cases that were labelled as "prescriptive" or "established". A telegraph manipulation test at six months was suggested to ascertain fitness for work. If the officer was unable to perform, then any "presumptive" cases became fully recognised as that of "established telegraphists' cramp", and the officer relieved of manipulative duties. The final confirmation of the diagnosis would come by associating use of the Morse key and examination of the printed output slip. Dr Sinclair took an objective and pragmatic approach to the whole process of diagnosis, treatment and establishing causality and work relatedness.

On receipt of this document, Dr Wilson re-wrote this procedure as a somewhat illegible hand written draft.[419] The content and writing style of this draft is interesting because it is evident he still believed that telegraphists' cramp affected only a few operators using the Morse key,

[419] See *Letter from Dr Wilson to Raven,* POST 30/3400, File XII (January 13th, 1909), London: BT Archive. The handwritten nature of this document might raise a question about the level of authority it might have within the Post Office, however hand written documents containing guidance and instructions to staff were fairly common in the Post Office, as they were later directly printed as paper documents.

although acknowledged that it developed only once the operator had become an expert Morse key user and not during the period of learning.[420] It was not a comprehensive account to provide useful direction and guidance to the Post Office Medical Officers, and my interpretation is that it was a deliberate device designed to steer the Medical Officers away from making a diagnosis and certifying telegraphists' cramp and thus qualifying for compensation. The details of signs and symptoms were negatively portrayed, with more emphasis on those which were not telegraphists' cramp for example rheumatism, and other nervous disorders which might reduce manipulation ability, rather than those that were. "Tired sensations" as a result of manipulation effort in learners needed to be distinguished from the pain and discomfort of telegraphists' cramp. Dr Wilson gave no indication of the need for physical examination of the patient, this could have been easily addressed by directly using Dr Sinclair's words. As for treatment, the six month period away from manipulative duties was included but there was no mention of the three month review stage or the Morse test. Almost as an afterthought and in the final paragraph, the use of Morse signalling slips was recommended to detect evidence of jerkiness in signalling and illegibility of signals, compared to normal Morse output. Doubtful cases were to be referred to the Chief Medical Officer (Dr Wilson) for a final decision. Despite the initial request in December for some advice to be sent to the Post Office Medical Officers "as soon as possible", the notifying circular based on Dr Wilson's document, was finally distributed at the end of April 1909, and written by the Post Office secretaries, nearly four months after the formal scheduling of telegraphists' cramp.[421]

[420] This point was emphasised by being underlined.
[421] This demonstrates the low priority the Post Office were still attaching to telegraphists' cramp.

4.5 Telegraph equipment trials

Trials of alternative telegraph equipment commenced in June 1908, simultaneously with the Industrial Diseases Committee hearing. My analysis of the events and dialogues that occurred during these trials provide examples of the institutional resistance, poor attitudes, and lack of understanding towards telegraphists' suffering cramp held by that Post Office management and supervisory staff. The protagonist who motivated the Post Office to undertake trials was again the MP John Robertson, who corresponded with the Postmaster General to express concern about the Morse equipment stating it was "viciously bad for the operators, however superior it might be in other ways".[422] Robertson questioned why America could find solutions to telegraphists' cramp, but the British Post Office could not. Despite the PTCA concerns about use of the Morse key, analysis of the correspondence between the Central Telegraph Office (CTO) and Post Office secretaries demonstrates that the telegraph branch had made no effort to look for alternatives to the Morse key.[423] Eames of the CTO refuted the claims made by the PTCA regarding the poor construction of Morse keys and appeared to take every opportunity to discredit the use of alternative telegraph machines.[424] For example, he argued that the Hughes machine (Figure 4-2):

> was good for underground lines but needed greater manpower on busy circuits because it used a tape printer and copies of everything had to be made for office use. Yetman and Kotyra machines, whilst they did give relief from telegraphists' cramp

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[422] See *Letter from John Robertson to Sydney Buxton,* and *Response from Sydney Buxton,* POST 30/3399, File VI (April 29rd and May 1st, 1908), London: BT Archive. He enclosed a report from the American journal Telegraph Age, which suggested that telegraphists' or writers' cramp was less prevalent in the United States than England because they had adopted improved sending apparatus citing the use of transmitting machines.
[423] See correspondence between Raven and Eames of CTO: *Letter from Leonard Raven to the Telegraph Branch,* POST 30/3399, File VI (June1st, 1908) and *Letter from Eames to Raven,* POST 30/3399, File VI (June5th, 1908), London: BT Archive. There were supposed to be eleven Yetman machines waiting to be connected in the CTO, however Eames stated he was only aware of one in use and appeared to be unable to locate the rest.
[424]See *Letter from Hoskyns-Abrahall to Eames,* POST 30/3399, File VI (June18th, 1908), London: BT Archive.

had no other advantages – they cost more, took up more space and needed more maintenance.[425]

Figure 4-2 Hughes telegraph

(Photograph: downloaded from Science museum website).[426] Note that this was operated with piano like keys which transcribed letters and numbers.

Eames was intransigent in his view that there had been no complaints; operators were happy with the Morse keys and nothing was superior to them. My interpretation is that he

[425] Kotyra and Yetman apparatus were operated by using a typewriter style interface rather than a single Morse key. See *Letter from Eames to the Secretary,* POST 30/3399, File VI (July 8th, 1908), London: BT Archive.
[426] Images freely available from https://www.sciencemuseum.org.uk/objects-and-stories), last accessed 10/05/2019.

was more concerned with his own reputation within the Post Office as Head Controller in the CTO who was not a great believer in newer technologies, newer working methods or the existence of telegraphists' cramp. This attitude would not have engendered a sympathetic approach to telegraphists with cramp in the CTO.

Towards the end of July and after the Industrial Diseases Committee hearing, changed opinions towards alternative technologies surfaced within Post Office management and a more cautious approach emerged on how telegraphists with cramp should be treated.[427] The Postmaster General's staff now insisted that there was a need to find suitable work for officers affected with telegraphists' cramp to avoid retirement or reduction in pay, but without preferential treatment. Potentially this was a difficult organisational management situation for the telegraph office controllers to fulfil with trying to satisfy both their higher management, but also their reporting staff. Also, there was a work demand to operator mismatch, as in the CTO and probably elsewhere Hughes machines were used only on busy circuits to meet heavy work throughputs. There was an inherent problem in moving an injured telegraphist possibly with less experience of the Hughes machines to higher pressure work, even though their cramp may have been relieved. [428] In consultation with one of the regional telegraph offices the Post Office secretaries sought opinion on the use of keyboard instruments (such as the Hughes) as replacements for Morse keys as well as investigating the PTCA allegation that Morse keys were badly constructed.[429] The views of one Liverpool telegraph controller were similar to those of Eames namely that there were no concerns about Morse key use among Liverpool staff. The Liverpool view was generally that "no one (Morse) key produces

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[427] It is possible that the Postmaster General's secretaries had some awareness that telegraphists' cramp was likely to become scheduled, by the evidence in the ensuing correspondence between the Committee Secretary and the Postmaster General. See *Letter from Frank Elliott the Postmaster General,* POST 30/3399, File VIII (July 24th, 1908), London: BT Archive.

[428] See exchanges between Eames and Raven, between July 25th and 1st August, POST 30/3399, File VI (1908), London: BT Archive.

[429] The Liverpool Office was selected and Mr Salisbury, the telegraph controller contacted. At this time Liverpool was also the PTCA headquarters. See *Letter from Raven to Salisbury,* POST 30/3399, File VI (August 14th, 1908), London: BT Archive.

cramp" and "that persons affected with telegraphists' cramp are more or less of a nervous temperament who may be predisposed to suffer from such affections".[430] This consultation exercise did not really clarify matters and by mid-August 1908, there was continued disagreement between the PTCA and the telegraph supervisors. The PTCA had reported to the Industrial Diseases Committee that increasing numbers were being affected by telegraphists' cramp and badly constructed Morse keys were a factor in this. Telegraph supervisors challenged this. They expressed doubt over the benefits of Morse key alternatives and appeared unwilling to set up alternative systems. To resolve equipment concerns, a separate new committee was proposed to the Postmaster General to review new telegraph systems and instruments that had been used on a trial basis. I argue that by this stage the Post Office as a corporate body adopted a view that whilst telegraphists should work to produce the "rapid and accurate transmission of telegrams", making the work easier should also be considered. The terms of reference of the proposed committee were to review the results of the various trials and to report on what further actions should be taken. The Postmaster General was supportive and agreed to this approach.[431] Therefore eventually, Post Office staff did recognise the role of the Morse key in the cramp problems experienced by telegraphists.

[430] See *Letter from Salisbury to Raven,* POST 30/3399, File VI (August 22nd, 1908), London: BT Archive.
[431] See *Memo from A F King to the Postmaster General,* POST 30/3399, File VI (August 20th, 1908), London: BT Archive. King nominated the panel members including staff from Post Office Headquarters, staff from CTO (not including Eames), a traffic manager and an engineer, but no PTCA representative.

4.6 Analytical models for telegraphists' cramp

One of my research aims has been to generate an explanatory model of telegraphists' cramp that accounted for the history of the disease during its lifecycle. The first strand of this model proposes that the framing and definition of telegraphists' cramp altered in response to changing medical, political, and scientific arguments. The creation of a mapping model of the disease to account for the sociopolitical climate and, individual and organisational responses to the disease would reflect these changing responses with the time course of the disease. However, such a model does not reflect the beliefs, networks of discussion and, ultimately, the framing of the disease from a human centred perspective. Using Fleckian principles I have created a second strand of the model. This is a mapping model to define relevant thought collectives and their structural composition of esoteric groups ('specialised' and 'generalised' experts) and exoteric groups (lay persons).

The remit of the Industrial Diseases Committee was to examine occupational diseases in the context of awarding damages for injury (i.e. compensation). Their mode of operation was to establish causality by examination of medical evidence with supplementary evidence from work place activities for the diseased being scrutinised. Therefore, I argue that the sociopolitical framework for Stage 1 of the first mapping model can be justified as being the 1908 Workers Compensation Act (WCA), aligning with the Liberal government's agenda for social and workplace reform at the beginning of the twentieth century. The purpose of the WCA was to compensate individual workers, therefore the sociopolitical context was singly the question of compensation for injury. The model also needs to reflect the individual response to the disease i.e. the medically diagnosed signs and symptoms. Workers compromised by occupational disease are located within their wider workplace environment; their employer's actions and responses to diseases thus form an organisational context. The Industrial Diseases Committee interpreted telegraphists' cramp not only as purely a medical

condition based on reported signs and symptoms but also an occupational disease where injured individuals should be compensated. The disease had been contracted in the context of employment as telegraphists undertaking work tasks for the Post Office, with diagnosis of signs and symptoms and confirmation of telegraphists' cramp provided by the Post Office Medical Officers. I propose that these three elements can be summarised as: the WCA (sociopolitical climate); signs and symptoms (individual response); and medical response to sanction compensation (organisational response) and that these define Stage 1 of telegraphists' cramp as a musculoskeletal occupational disease (see Figure 4-3).

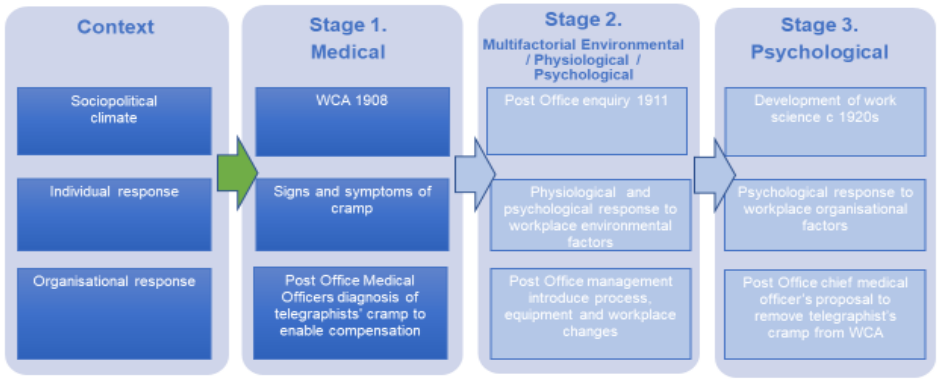

Figure 4-3 Stage 1 model for telegraphists' cramp as a musculoskeletal occupational disease.

From a Fleckian perspective, thought collectives and thought styles emerged during the route to compensation for the telegraphists. Broad thought collectives concerning telegraphists' cramp reflect the groups of actors involved: the telegraphists and PTCA, Post Office Management and the Postmaster General, and the medical professionals. The

Industrial Diseases Committee can also be considered as a discrete thought collective. They had differing views of telegraphists' cramp as the disease object, which in turn shaped the knowledge and experience of the disease to create the thought style. The archive artefacts provide evidence that there was reinforcement of opinion within the groups, leading to different opinion between groups on causation and work relatedness. For example, the PTCA and telegraphists' perspective was that the disease was work related and therefore should attract compensation. The Post Office secretaries' view was that the disease occurred through personal predisposition and should not be compensated. The medical professionals focused on the origin and epidemiology of the disease: the cerebral or peripheral physiological nature with no views about compensation. The Fleckian model also defines a structure to each thought collective with an inner group of "experts" (the esoteric circle) and a larger "lay" group which surrounds this (the exoteric circle) and a democratic exchange of ideas between the two groups within the thought collective. Each distinct thought collective interacts with others with communications across the thought collective boundaries. See Figure 4-4 which represents the operational thought collectives for telegraphists' cramp at the date of the Industrial Diseases Committee hearing. The definition of the esoteric and exoteric circles for each thought collective has been based on knowledge acquisition and how once acquired this was exchanged between groups. The PTCA knowledge was gained from observation of the Morse key and work environment and experience of the work as they were all (or had been) practising telegraphists. They communicated with the main workforce of telegraphists via face to face meetings, and publications to both share and gain information (especially of the prevalence of cramp).

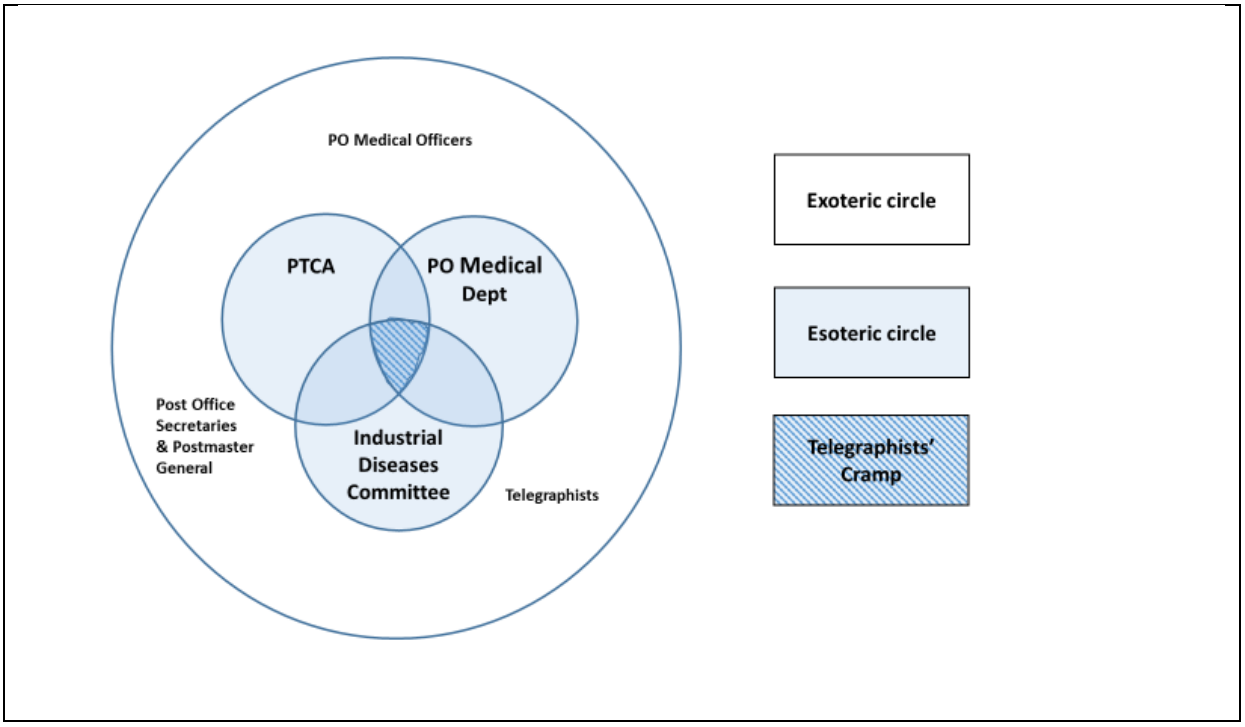

Figure 4-4 Fleckian mapping of telegraphists' cramp in 1908

The Post Office Medical department, Drs Wilson and Sinclair, drew their experiences from historical medical knowledge and beliefs about telegraphists' cramp, although as experts had differing views. Dr Wilson believed in the older central cerebral causation theory whilst Dr Sinclair used Gowers and Fulton as his medical knowledge base.[432] Dr Sinclair's data included observational experience of telegraphists at work and interpretation of Morse slips as evidence of telegraphists' cramp. Drs Wilson and Sinclair were the experts in terms of the wider group of Post Office Medical Officers. The Industrial Diseases Committee form another thought collective: an exoteric group expert in compensation analysis who would interact with the existing groups on the telegraphists' cramp disease object. The Post Office collective comprises a wide exoteric group consisting of all other Post Office Staff, whether telegraphists or Post Office management. They were dependent on other "experts" and

[432] See Chapter 2, for the theories of Gowers and Fulton.

external information regarding telegraphists' cramp such as previous compensation hearings. The Post Office staff's reinterpretation of information for the Postmaster General largely demonstrates misunderstanding or non-acceptance of expert information, especially medical knowledge as evidenced by the persistence of their own lay views and re-interpretation of materials from the expert groups.

4.7 Conclusion

Successive WCAs represent recognition of the need to compensate workers damaged by disease during their employment and as part of the Liberal government's desire for social and workplace reform. The pursuit of compensation for telegraphists' cramp added another dimension to the whole issue of compensation for contracting an occupational disease. I suggest that the concept of government civil servants working in a low risk environment contracting work-related disease had never been considered before. Indeed, office environments (and the work equipment being used) were excluded from the Factories Acts and the early WCAs as they were perceived to be safe environments. This was a major difference between the telegraphists and workers in other industries.

The evidence heard by the Industrial Diseases Committee on miners' nystagmus and other diseases was intensely scrutinised by Post Office management in their initial deliberations on the likelihood of telegraphists' cramp being scheduled, although the compensation question for telegraphists' cramp was raised externally by John Robertson an MP. From this point forwards there were tensions and antagonism between the PTCA, Post Office management and the Post Office Medical Department. The Home Office (The Industrial Diseases Committee) acted as mediators who enabled the scheduling of telegraphists' cramp. The telegraphists and especially the PTCA committees and their governing executive were the

most informed group, and I propose that they had more knowledge and expertise than both Post Office management and the Medical Department. My interpretation of the PTCA documents submitted to the Industrial Diseases Committee (and the prototype version) is that these provided a competent ergonomic evaluation of the major elements of the workplace system broken down into work tasks, work organisation and work environment. The interactions between the telegraphists and the work technology (the Morse key) and resulting psychological and physical effects on the telegraphist can be identified as a discrete human centred work system, derived from an observational based approach to knowledge acquisition supported by empirical data.[433] Both Dr Sinclair and the PTCA, approached the compensation question by using strategies designed to demonstrate the need for compensation for injured telegraphists and thus scheduling, to the Industrial Diseases Committee. Dr Sinclair provided medical data and data which aligned cramp signs and symptoms to Morse key use, and the PTCA supported their claim by the use of workplace derived empirical data. In addition to this, I argue that this approach was used to create agreed factual evidence which in the absence of other information became consolidated as informed theory. By contrast the telegraph supervisors appear to have been less informed, more dismissive and intransigent about the existence and prevalence of telegraphists' cramp. The evidence suggests Post Office management as represented by the Post Office secretariat and the Postmaster General, considered themselves to have some expertise in occupational disease apparent by the confident exchange of lay "medical knowledge" of occupational diseases and attempts to shape decisions about telegraphists' cramp being the result of inherent personal predisposition. This formed the basis for their opposition to the scheduling of telegraphists' cramp. The attitude apparent in the communications between the Post Office secretaries was largely dismissive of the PTCA evidence and the language used indicative of their belief that telegraphists were exaggerating the issues. I would suggest that none of them had observed telegraphists in

[433] For example, speeds of Morse code transmission.

the workplace as they demonstrated a remote and theoretical understanding of the daily work.[434]. The Post Office Medical Department view on the origin, causation and frequency of telegraphists' cramp differed between Drs Wilson and Sinclair. The former believed it was of cerebral origin with few telegraphists affected, whilst the latter aligned with Gower's peripheral origin theory. Dr Sinclair's suggestion of using the erroneous Morse slip output as a surrogate for telegraphists' cramp symptoms was an ingenious diagnostic test, although I suggest that this was an extension of Fulton's approach from some twenty years earlier. The Industrial Diseases Committee focused singly on the medical evidence, hardly surprising as their brief was to make a decision on compensation for work related disease.[435] Whilst there were opposing views on the existence, cause and nature of telegraphists' cramp, by the end of 1908, the PTCA had achieved one of their strategic goals, namely to have telegraphists' cramp recognised as an occupational disease and added to the third schedule of the WCA as a compensatable disease. This was not the end of their campaign and from this point onwards in time they maintained pressure on Post Office management regarding working conditions until the next enquiry in 1911.

[434] It is apparent that the PTCA viewed Postmaster General Buxton as sympathetic to their cause. Buxton's actions indicated that he believed in fairness of treatment. As an example, see "PTCA Leeds report", *The Telegraph Chronicle,* MSS.135/EU/5/10/27 (May15th, 1908), Warwick: Modern Records Centre Archive

[435] See the *Second Report of the Departmental Committee on Compensation for Industrial Diseases 1908*, Minutes of Evidence and Appendix (London: His Majesty's Stationary Office 1908), p3.

5 The second Post Office enquiry into telegraphists' cramp 1910 to 1911

5.1 Introduction

The purpose of this chapter is to discuss the second Post Office enquiry into telegraphists' cramp which occurred between 1910 and 1911. I present three main arguments. Firstly, I will examine the novel structure of the committee that was convened and why this was important. Secondly, I will discuss the innovative methodology deployed to establish the prevalence of the disease, which I believe to be the first occurrence of this technique in British industry and thus is significant in the history of occupational health. Thirdly, I discuss the multifactorial approach that was adopted to investigate the causes of the disease and then provide solutions. This merits discussion because of the similarities that can be found in the present day work environment and the assessment and prevention of musculoskeletal disorders in the contemporary workplace. The second enquiry was instigated by a change of Postmaster General in 1910 when Viscount Herbert Samuel replaced Sydney Buxton. The new Postmaster General wanted to establish the strategic approach to telegraphists' cramp taken by the Post Office as an organisation since the scheduling of telegraphists' cramp in 1908. Ultimately, this would also result in the emergence of an altered perspective on telegraphists' cramp as an occupational musculoskeletal disease.

Although the three contextual elements of my proposed social-historical model (sociopolitical climate, individual response and organisational response) remain consistent, the medical model of the disease changed to accommodate a central nervous system component. I

argue that the understanding of the disease was modified by the identification of a range of external factors (e.g. work rates, staffing levels) which were accepted by the second enquiry committee as contributory to the development of telegraphists' cramp. Therefore, it follows that a further development of the model for the disease is required to interpret the effects of multifactorial workplace environmental factors on the contextual understanding of the disease. In turn, the interpretative mapping of the Fleckian groups altered because of the operation of the enquiry and the cooperation of its members.

5.1.1 Background to the 1910 to 1911 enquiry

Despite the WCA scheduling requirements, evidence indicates that the PTCA continued to seek fair treatment while Post Office management continued to demonstrate a marked degree of institutional resistance towards telegraphists' cramp.[436] Industrial relations, which had previously been improving in terms of communications between the PTCA and Post Office reached a further low after the publication of information of Circulars to both Telegraph Surveyors and Post Office Medical Officers. These were generated in 1909, after the scheduling of telegraphists' cramp for information and guidance on how to deal with cases of telegraphists' cramp. The PTCA objected strongly claiming that whilst they had provided extensive evidence to the 1908 enquiry, they had been excluded from any consultation and negotiations concerning the content of the Circulars.[437] Their campaign against the Post Office took on a new and public dimension with a scathing attack against their employers in

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[436] There is a large volume of Post Office internal correspondence which supports this suggestion. Much of these discussions relates to unfair treatment of individual cases of telegraphists' cramp and the Post Office stopping those affected at the 'efficiency bar', which prevented wage and grade rises. There was also extensive discussion of how these requirements should be presented to Post Office Surveyors and Medical Officers. See POST 30/3400, File XIII (dated 5th March to 20th April 1909) and File XIV (25th March to 14th May 1909), BT Archive, London.

[437] The PTCA commented that it was as if the Postmaster General had not even read the 1908 enquiry reports. See *Circular to Surveyors 31,1909* and *Circular to Medical Officers 230,100/09,* POST 30/3400, File XIV (April 14th, 1909), BT Archive, London.

The Telegraph Chronicle.[438] They argued that they were good enough to be heard at the 1908 Home Office Committee, but now were not deemed worthy to contribute or be consulted on the content of the Circulars. Part of the published article included a direct message to the Postmaster General requesting further PTCA involvement:

> these instructions have raised suspicion and disquiet among the Telegraph Service and we urge Mr Buxton to reconsider the whole question in consultation with the PTCA.

There was no direct response from Post Office management to this request. However other departments were attempting to improve the working conditions of telegraphists, for example, telegraph controllers, engineers and, Post Office secretaries reviewed the use of alternative telegraphy equipment. Although the focus was largely on Morse key adaptations, this included measures to improve comfort which in turn would minimise manipulation difficulties and thus the potential for cramp,[439] The reality, though, was that despite the good intentions expressed in the chain of written communications nothing in the workplace changed, and the Morse key remained the dominant telegraph system in use.

5.2 The novel structure of the 1910 enquiry committee

The process employed by Samuel in setting up a new committee to investigate telegraphists' cramp represents a new approach to investigation of occupational disease in British industry and I will justify this argument in this section of the chapter. For example, whilst there had been other committees previously, their constitution and remit had largely been defined by

[438] This article was carried on the front page. See *The Telegraph Chronicle, Volume XXXIV, No.439,* POST 30/3400, File XVI (July 23rd, 1909), London: BT Archive.
[439] See for example, the chain of correspondence between June to September 1909, POST 30/3400, File XVII (1909), London: BT Archive.

the government Home Office for the specific purposes of setting legislative regulation and to decrease specific industrial disease mortality rates.[440] Even the comparatively recent Industrial Diseases Committee chaired by Samuel, although it examined a range of industries and witnesses for the purposes of compensation, was driven by the Home Office. In the Post Office, Samuel adopted much more of a team approach with representation from the different Post Office departments associated with telegraphy operations.

When Herbert Samuel took over as Postmaster General in 1910, one of his first priorities was to enquire about the status of telegraphists' cramp within the Post Office. In his previous capacity as chairman of the Industrial Diseases Committee he had heard evidence for the disease and reasons for why it should be scheduled. He incorrectly assumed that a large government organisation like the Post Office would have implemented some measures to mitigate against the disease. Samuel was somewhat dissatisfied with the management response to his enquiries which were suggestive of the internal filtering of information that had occurred with his predecessor Sydney Buxton.[441] This motivated Samuel to propose his own internal Post Office enquiry into the disease. One interpretation of this is that it was part of a strategy to facilitate the Post Office response to telegraphists' cramp and to improve industrial relations with the PTCA and the telegraphists, but it may also suggest Samuel wanted a degree of control to ensure a robust enquiry with defined solutions.

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[440] For example, there was a Royal Commission on Factories and Workshops which reported in 1876 on investigations of into Lead, Arsenic and Phosphorus poisonings. See Bartrip, *The Home Office and the Dangerous Trades,* p102, pp153-4 and pp190-194.

[441] See for example, *Memo from AG Leonard*, POST 30/3400, File XIX (March 2nd, 1910), and *Memo from Raven and Paterson to the Postmaster General*, POST 30/3400, File XIX (March 3rd, 1910), London: BT Archive. The first memo concluded that telegraphists' cramp was a rare disease and the second which provided details of numbers affected cited solely data from the CTO, thus giving false impressions about the numbers of telegraphists affected.

Samuel's secretary, Alexander King, proposed suitable names and roles for members of the new committee and nominated the assistant Postmaster General as chairman.[442] Samuel accepted some of the names proposed as they represented a breadth of profile representing Post Office middle management as well as technical expertise in telegraphy. In addition, two doctors, telegraph supervisors, PTCA representation and affected telegraphists were included to ensure broad coverage of the issues. The constituent members were staff who had acquired knowledge and information of telegraphists' cramp first hand from dealing with injured telegraphists in the workplace. This range of staff skills, knowledge and expertise all working together to resolve a health issue, constituted a novel team approach to examining workplace health problems in the early twentieth century and a marked departure from previous government-led workplace health and disease investigative committees.[443] In addition, Samuel appointed an external chair, Sir John Barran, a fellow Liberal peer and previous chairman of a government Factories committee, rather than the assistant Postmaster General. Samuel believed the appointment of a high profile chair would raise the public profile of telegraphists' cramp and indeed this was the result.[444] The other committee members were Dr John Sinclair, Post Office Deputy Medical Officer; Dr Theodore Thompson an external hospital consultant neurologist; Mr A Leonard chair of the Post Office telegraph instruments committee and Post Office management representative; Mr T Purves, a staff telegraph engineer; and, Mr RH Davies of the PTCA who had also given evidence at the 1908 Industrial Diseases Committee.[445]

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[442] See *Memo to Postmaster General*, POST 30/3400, File XIX (March 15th, 1910), London: BT Archive.
[443] See the *Report of the Departmental Committee on Compensation for Industrial Diseases, Report* (London: His Majesty's Stationary Office 1907), to gain an idea of the committee structure, who was involved and how the committee operated.
[444] See, for example, *The Scotsman,* April 2nd, 1910, p 8 and *Manchester Guardian,* March 29th, 1910, p 10. It was also publicised by the Association of British Postal Medical Officers as Samuel attended their annual meeting. See "The Association of British Postal Medical Officers", *The Lancet,* 1910; Volume 176 (4534) p 247.
[445] Dr Thompson was a young neurologist who qualified in London in 1903. Between 1901 and 1909 he had various publications on the neurology of the spinal cord and worked at the London Hospital.

The public profile of the disease was further raised by Samuel reporting the implementation of the committee to Parliament. In his new role as Postmaster General he stated that he was:

> eager to adopt any means that science can devise in order to provide what is better than either compensation or cure of the disease and that is prevention of occurrence.[446]

Samuel both commissioned the enquiry and set the broad terms of reference. This was an internal enquiry into a government civil service department and because of the publicity received had the potential to expose poor work practices which resulted in the ill-health and sometimes disablement of its workforce. There are also important points that relate to Samuel's motives for structuring the committee and enquiry in the way he did. Samuel was a radical Liberal and known as a social reformer, whose political philosophy is said to have provided an intellectual foundation for much of the social reform introduced by Liberal governments since 1905.[447] He was thus driven by this background to improve the working conditions of his telegraphists as part of a modernisation of the Post Office. He had witnessed first-hand the evidence provided by the PTCA at the 1908 enquiry and had read or at least had sight of reports of telegraphists injured by the effects of telegraphy according to archive documentation. [448] Many of these who had contracted telegraphists' cramp had either left employment by the Post Office or had been redeployed to other roles probably with loss of professional status and more importantly earnings. With his Liberal reformist beliefs, Samuel was a strong advocate of prevention and social welfare, therefore there is a strong

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[446] The archive contains a short, printed extract from the Parliamentary debates of 23rd June 1910. See POST 30/3400, File XIX (June 23rd, 1910), London: BT Archive.
[447] See the Oxford Dictionary of National Biography for further details of Herbert Samuel, retrieved from http://www.oxforddnb.com/view/article/35928, last accessed 10/05/2019.
[448] Details of this correspondence can be found in POST 30/3400, File XIII (dated 5th to 20th March 1909) and POST 30/3400, File XIV (March to April 1909). BT Archive.

possibility he believed it was unjustifiable for a Post Office employee to be injured in the course of their work and especially an employee of a government department of which he was the leader and for which he was responsible. The evidence presented therefore supports my argument that this was a novel approach to structuring a work enquiry committee and especially in 1910.

5.3 An innovative enquiry methodology

The innovative methodology used by the committee employed multifaceted approaches to examining the problem of telegraphists' cramp in the Post Office. This methodology is historically important as the ground-breaking approaches deployed represent a milestone in the timeline of occupational health. These also strongly anticipated present day processes used in the investigation of workplace musculoskeletal disorders.[449] The evidence presented supports my argument that an innovative methodology was adopted.

Herbert Samuel had defined the starting point for the committee which was the unequivocal existence of telegraphists' cramp as a defined occupational disease, so that there would be no further debate within the Post Office on the issue. He also defined the terms of reference to be used by the committee:

> to enquire into the prevalence and causes of the disease known as telegraphists' cramp and report what measures may be adopted for its prevention.[450]

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[449] For a summary on present day techniques used, see for example, *Musculoskeletal Disorders, Mental Health and the Work Environment,* HSE Research Report 316 (Norwich: HSE Books, 2005) *and Upper Limb Disorders in the Workplace*, HSG60 (Norwich: HSE Books 2002).
[450] See the *Report of the Departmental Committee on Telegraphists' Cramp*, p A2 (London: His Majesty's Stationery Office, 1911).

Prior to 1910, the approach taken by a government enquiry into an occupational disease was based on a committee and witness process, whereby a committee would hear expert evidence and witness statements, with judgement supported by personal opinion. The approach taken by the Post Office enquiry committee was very different to this. From the outset the committee members were organised by using a division of labour method. The members were each delegated tasks and areas to research according to their knowledge and expertise, for example the two doctors (Dr Sinclair and Dr Thompson), formed a medical subcommittee which produced a separate report. The specialist reports from these separate research tasks were brought back and discussed by the committee as a whole, before decisions were made. Therefore, there were separate strands of investigation in the enquiry process. Five of these focused on using different methods to establish the prevalence and cause of the disease and used some comparative data from Europe and the USA, as until prevalence and cause was established, there could be no progress on finding solutions to telegraphists' cramp. The two remaining strands examined evidence from Post Office management witnesses and reports from telegraph equipment trials.

5.3.1 Establishing the prevalence of the disease

The work on establishing the prevalence of telegraphists' cramp was undertaken by Drs Sinclair and Thompson and was a major part of the enquiry and provides strong evidence of the innovative approach used.[451] There was nothing particularly remarkable about reviewing the historical evidence for telegraphists' cramp and this would be expected as a starting point for any research.[452] After reviewing and writing a short history of telegraphists' cramp, the doctors examined seventeen witnesses who were telegraphists reporting manipulation

[451] This was presented to the committee as a separate report. See *Appendix 1, Report of the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery Office, 1911).
[452] The reports by Dr Onimus, and Drs Robinson and Fulton were referenced as literature sources for the doctors' report.

difficulties. The outcome of the historical review and the questioning and physical examination of these seventeen witnesses, was the generation of a new definition of the disease:

> The characteristic feature of the disease is an involuntary violent and painful contraction of the muscles and throughout the telegraph service, such visible spasm is regarded as the mark of the disease and, telegraphists' cramp may be defined as a disease of the central nervous system characterised by visible spasm of the hand and /or arm during the manipulation of a telegraph instrument and by impairment of the power of making the specific coordinated movements needed for such manipulation.[453]

This was established before the next stages in the doctors' strategy for examining prevalence. This definition now included an "early subjective stage" when pain was felt immediately on keying – thus enabling a distinction to be drawn from pain resulting from fatigue. Examination of the seventeen witnesses reporting manipulation difficulties who had been classified as having telegraphists' cramp enabled further insight. Of these Drs Sinclair and Thompson discerned ten (59%) they "considered to be true telegraphists' cramp" and six of these were further examined:

> The nervous system was completely investigated and found to be normal. No muscular wasting and no alteration in the reactions was found. No alteration in sensibility of the skin of the hands or deeper structures was discovered. Such a result

[453] See *Appendix 1, Report of the Departmental Committee on Telegraphists' Cramp,* p 1. After the enquiry the doctors published this in three parts, see *The Lancet*, 1912, Volume 179 (4622) pp 888-890, Volume 179 (4623) pp 941-944, and Volume 179 (4624) pp 1008-102. It is very surprising that the Post Office permitted publication of this into the public domain. Nevertheless it was a useful device to alert the medical profession to telegraphists' cramp.

> points to the disorder being of a central origin and not to any failure in the muscles or in the sensori-motor peripheral mechanism.[454]

The lack of visible physiological evidence further supported the role of the central nervous system's involvement in the disease, but another significant point that emerged was that the updated definition was not specific to the Morse key, as the doctors concluded that use of the Hughes and Baudot instruments "could bring about relative cramp (analogous to pianist's cramp)".[455]

Subsequent to this, a major innovative methodology was adopted as the committee decided that new data to establish prevalence was needed and discussed various options. The preferred option was to "invite voluntary statements from staff to the committee", in present day language this translates as collecting data from the workforce by completion of a workplace questionnaire. Today this is an accepted and standard ergonomics methodology used in response to the identification of a workplace health issue such as musculoskeletal problems.[456] In 1910 however, this was a completely new approach for examining health symptoms in the workplace. As far as I am aware, this was the first occurrence in British industry of employees in an office based environment being asked information about their work routines and work-related health problems, as distinguished from individual medical consultations about symptoms. I also suggest that a questionnaire was recommended because the telegraphists were considered professional staff.[457] There is no evidence concerning authorship of the questionnaire; it is possible that the doctors devised it, but the

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[454] See p36, *Appendix 1, Report of the Departmental Committee on Telegraphists' Cramp.* The detailed medical case histories can be found in Appendix A to Appendix 1 of the report.
[455] See p 6, Report on the Departmental Committee on Telegraphists' Cramp.
[456] One example of a present day questionnaire for self-assessment of musculoskeletal symptoms is the Standardised Nordic Musculoskeletal Questionnaire, first developed in 1987. See Kuorinka, I, Jonsson, B, Kilbom, A, Vinterberg, H, Biering-Sorensen, F, et al, "Standardised Nordic Questionnaires for the Analysis of Musculoskeletal Symptoms". *Applied Ergonomics,* 18,1987, pp 233-237.
[457] Especially when compared to manual labourers such as miners, or factory workers.

more important point is that it was well presented for the intention of gathering data to establish prevalence of occupational disease symptoms within a workforce. Respondents were asked to date their response and were given the opportunity to sign it if they wished to waive anonymity. The questionnaire instrument was prefaced with an explanation for the information gathering exercise (i.e. to gather statistics about telegraphists' cramp) and stated it could be completed anonymously. Permitting optional anonymity is also significant and remains a central tenet of ethical considerations in the present day. The procedure required completed forms to be returned to work supervisors in a sealed envelope which was provided. The question types were open ended and thus required a mixture of qualitative (written) and quantitative responses, although there were no rating scales or forced choice questions. Scope of the question content included age, length of service and then proceeded to ask about Morse key use: length of use, training received (if any), ambidexterity (and the reasons for it), and time spent sending / receiving messages. Having established work routines, questions focused on pain and symptoms: when these occurred, their relationship to other health issues, symptom pattern and finally if non-work difficulties were affected (e.g. writing, using cutlery, sewing). A copy of the questionnaire can be found in Appendix B of the thesis. [458]

A total of 8153 telegraphists were surveyed and the response rate was 90% which is an extraordinarily high response rate.[459] Significantly, 75% of those waived anonymity. There are two reasons as an explanation for the high response. Firstly, telegraphists' cramp was a health issue among the workforce which had been much publicised by PTCA campaigns. Secondly, a workplace questionnaire had never been used and I would suggest that this reflects an optimistic belief by the telegraphists that their employers were at last interested

[458] A blank copy of the questionnaire was included in the final report. See pp 50-51, *Appendix 1, Report of the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery Office, 1911).
[459] The survey population was CTO, and the major Telegraph offices throughout Britain. Personal experience and observation of present day workplace surveys suggests response rates of 60% to 70% are deemed acceptable for valid survey data.

and wanted to hear the problems they were experiencing. A subset of the questionnaires was analysed in the first instance by using the data from 'F' division of the CTO as a representative sample. Doctors Sinclair and Thompson found an 85% response rate (155 replies) with 65% (100) reports of keying difficulties. The doctors physically examined 148 of this sample and of the 93 within this 148, reporting keying difficulties they diagnosed 13 cases with true cramp or early cramp, and 80 cases of fatigue. Their conclusion was that whilst keying difficulty reports were accurate, actual cases of true cramp diagnosed were 50% less than the reports. When the rest of the data were analysed the doctors identified "true cramp" symptoms to exist in 5.7% (404) of the respondents, with a further 32.9% (2360) reporting "keying difficulties" suggestive of muscular fatigue.[460] This process also reflects standard present practice for follow up, when a sample of the whole cohort may be further evaluated by medical examination or interviews to gain more details and validate the questionnaire data.[461]

The prevalence rates in Britain were then compared to those in mainland Europe, India and the United States. A letter with standard questions was sent to telegraph controllers requesting numbers of those affected with cramp. Most of the European countries declared a low number of cramp cases.[462] In the United States rates of 4% and 10% were reported for the Western Union Telegraph Company and the Postal Telegraph Company respectively, and whilst little detail was provided, this was broadly consistent with the Post Office data. [463] The committee concluded that whilst numbers suffering cramp were less than reported or expected, there was still a strong need for "definite methods of prevention and relief". This

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[460] The analysis also examined wider organisational factors such as ambidexterity, training received, length of service and equipment complaints about Morse keys. See sub *Appendices F to H*, of *Appendix 1, Report of the Departmental Committee on Telegraphists' Cramp.*

[461] See *Report of the Departmental Committee on Telegraphists' Cramp*, p 6.

[462] European countries who were contacted and who responded were Austria, Belgium, France, Germany and Italy. Data from India were provided by John Newlands, the CTO Controller who worked in India from 1907 to 1909. See *Report of the Departmental Committee on Telegraphists' Cramp,* Appendix 3.

[463] See *Report of the Departmental Committee on Telegraphists' Cramp,* Appendix 4.

was entirely consistent with Samuel's desire for a solution to the telegraphists' cramp problems he had inherited when he became Postmaster General and also demonstrates a genuine desire by the committee as an investigating body to fully investigate and find solutions to telegraphists' cramp within the Post Office. This was an innovative and very modern approach to investigating the musculoskeletal health of the telegraphists utilising a workforce questionnaire to establish the prevalence of the disease. This is wholly consistent with present day ergonomics methodologies used for data collection when investigating an occupational health issue among a worker population.

5.4 A dynamic multifactorial approach to telegraphists' cramp

After review of the telegraphist survey data to establish prevalence of telegraphists' cramp in the Post Office, the team-driven approach to problem solving continued to address the causes of the disease and then propose strategies that could be implemented. As telegraphists' cramp was a complex issue, there was never going to be a single cause or solution. Early recognition of the different workplace elements which contributed to the onset and proliferation of the disease resulted in a broad approach to consider all the potentially relevant factors. This can be identified as a multifactorial approach which is also consistent with present day methodology for identifying risk factors for work-related musculoskeletal disorders.[464] The following evidence supports the case that an evolving and dynamic process was deployed by the committee to establish both causality and then propose solutions to the telegraphists' cramp conundrum.

[464] For a present-day approach to musculoskeletal disorders in the workplace, see for example IL Nunes retrieved from https://oshwiki.eu/wiki/Introduction_to_musculoskeletal_disorders, last accessed 10/05/2019.

5.4.1 Multifactorial causes of the disease

The starting point for examining causality was the following agreed definition of telegraphists' cramp:

> [The] nervous breakdown known as telegraphists' cramp is due to the combination of two factors, one a nervous instability on the part of the operator, and the other repeated fatigue during the complicated movements required for sending messages by hand on a telegraph instrument. Fatigue is essentially different from cramp, and a person of average health can suffer fatigue again and again indefinitely without becoming affected with cramp; but if a nervous instability exists, fatigue cannot be prolonged beyond a certain point without causing cramp.[465]

This differed from the medical-scientific definition proposed by Doctors Sinclair and Thompson permits a distinction between cramp and fatigue but also acknowledges but also acknowledges personal nervous instability which may arise from an inherent psychological predisposition. Fatigue was distinguished from cramp by being a "repeatable condition" without the resulting physiological cramp effects, although this was dependent on the nervous constitution of the subject and was a "personal factor" bearing no relationship to the amount of work performed. It can be argued that this was a sociopolitical definition as it gave recognition that fatigue, whilst not a medical condition *per se*, was an important factor that required consideration in the overall cramp debate. Excessive telegraphist workload had been persistently raised by the PTCA both at the 1908 enquiry and in subsequent communications with the Post Office. It follows that this dual definition which separated the effects of fatigue from medical symptoms was intended to finally silence the cramp doubters

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[465] See p9, *Report of the Departmental Committee on Telegraphists' Cramp,* (London: His Majesty's Stationery Office, 1911).

within the Post Office and allow latitude for establishing means of prevention that would be beneficial for all telegraphists by looking as widely as possible at a range of options.

Overlaid on this, the committee identified multifactorial causes which individually or in combination would increase the risk of developing telegraphists' cramp. These were:

- Individual constitutional weakness
- Inaptitude for telegraphy
- Work rate and amount
- Bad manipulation style
- Too early responsibility
- Heavy manual work
- Morse key construction
- Inadequate work accommodation

Vast amounts of data were gathered from different sources to substantiate the factors listed above. The data handling process was complex, as each source had the potential to inform more than one of the causal factors. For example, work rate and amount were derived from data sources such as: the 1908 enquiry, PTCA witness statements, recruitment data, telegraph traffic returns and current work schedules. See Appendix C for my further analysis of this. I propose that identification of these factors transposed the causes of cramp from being considered in purely medical terms to a context involving individual physiological and psychological responses to the broader work environment, but which also included psychological predisposition (i.e. nervous instability). I also argue that this broadens the initial definition of the Post Office telegraph operation as a simple ergonomic work system to a wider human centred one encompassing the additional workplace factors identified both as environmental physiological and psychological factors and multifactorial causes for

telegraphists' cramp. The process adopted by the committee also demonstrates that again, this was a novel approach to examining a workplace occupational health issue in 1910.

5.4.2 Multifactorial solutions to the disease

Once multifactorial causes of telegraphists' cramp were identified, it followed that multiple and different solutions would be required. This was another new approach devised by the committee and different when compared to other occupational diseases in the early twentieth century. For example, with miners' nystagmus (which had been classified as an occupational neurosis), a single solution was deployed by permanently removing affected miners from underground work.[466] If a comparable approach to this had been adopted for telegraphists' cramp, then the Post Office would have either dismissed or redeployed those affected to non-telegraphy work as a strategy for resolving the disease. In this section I will demonstrate that this single strand approach was not used, but a strategy of multifactorial solutions devised.

The first part of the strategy focused on the telegraphist recruitment processes. The existing practices were already sophisticated for a government organisation in the early 1900s, especially with the use of routine pre-employment screening for all prospective new staff.[467] In the years leading up to the enquiry, there had been much debate among Post Office management as to whether telegraphy learners could contract cramp and the effect of inherent personal characteristics such as nervous instability. This justifies why the committee examined this in depth and reached a decision to strengthen the pre-employment medical process, not so much because they believed that learners did contract cramp, but more as an avoidance to mitigate the risk of developing cramp later in a telegraphist's career. The

[466] In its early history, telegraphists' cramp was defined as an occupational neurosis and compared to miners' nystagmus.
[467] As detailed in Chapter 3, these commenced in 1871 within the Post Office.

Post Office Medical Officers would now be required to identify nervous conditions, relevant family history (e.g. epilepsy, hysteria), physical characteristics of the hands and wrists by an enhanced physical examination. Another important change to the recruitment process was that prospective candidates should undertake a telegraph work trial to determine their aptitude for the role.[468] Modifying the recruitment process therefore provided the Post Office with a mechanism to avoid taking on staff who might have a personal predisposition to telegraphists' cramp or who showed no aptitude for telegraphy during the work trial.[469] The second part of the solution strategy was broader and more complex as it required modification of training processes, equipment and the workplace. For example, proposed arrangements for training included the setting up of dedicated training centres, the provision of dedicated training staff and specified daily instruction time (one hour). Equipment modifications reviewed and discussed included the design and engineering specification for Morse keys. Workplace factors included the provision of adjustable chairs, and alternative telegraphy devices to the Morse key (including the typewriter and telephone).[470]

Style of sending using the Morse key was considered as a separate priority item by the committee, who devised specific and updated instructions to those already existing:

> The hand and forearm should be approximately level and in line with the key, the signals should be sent with free movement of the wrist, the key should not be pinched or gripped, and there should be no rigidity or constraint.[471]

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[468] This is another example of the Post Office leading in the workplace. It was not until the 1920s, with the advances in the study of work science and work psychology that "vocational testing" as it became labelled was recommended as a tool for employers to use for examining prospective employees for jobs requiring a degree of manual dexterity. For a later paper discussing this see W Spielman Raphael and GH Roberts, "The Selection of Telephone Operators", *The Human Factor,* Volume VI (11) 1932.

[469] The consequence would be no job contract, except for staff who had transferred into the telegraph service from other branches of the Post Office and this was at the Postmaster General's discretion.

[470] Note, the "instruments and apparatus" section formed the bulk of the discussion on solutions. See pp 27 -33, *Report of the Departmental Committee on Telegraphists' Cramp,* (London: His Majesty's Stationery Office, 1911).

[471] See p 24, *Report of the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery

These instructions are consistent with present day ergonomic advice and legislative guidance on using a computer mouse, which were derived from using a similar multifactorial approach to problem resolution as used by the 1910 enquiry committee (see Figure 5-1).[472] It can be argued that this was the first occurrence of advice being given to employees on using office equipment. The importance attached by the committee to these instructions is supported by the evidence that they were presented as a directive from the Postmaster General, a device intended to convey a serious message to staff.[473]

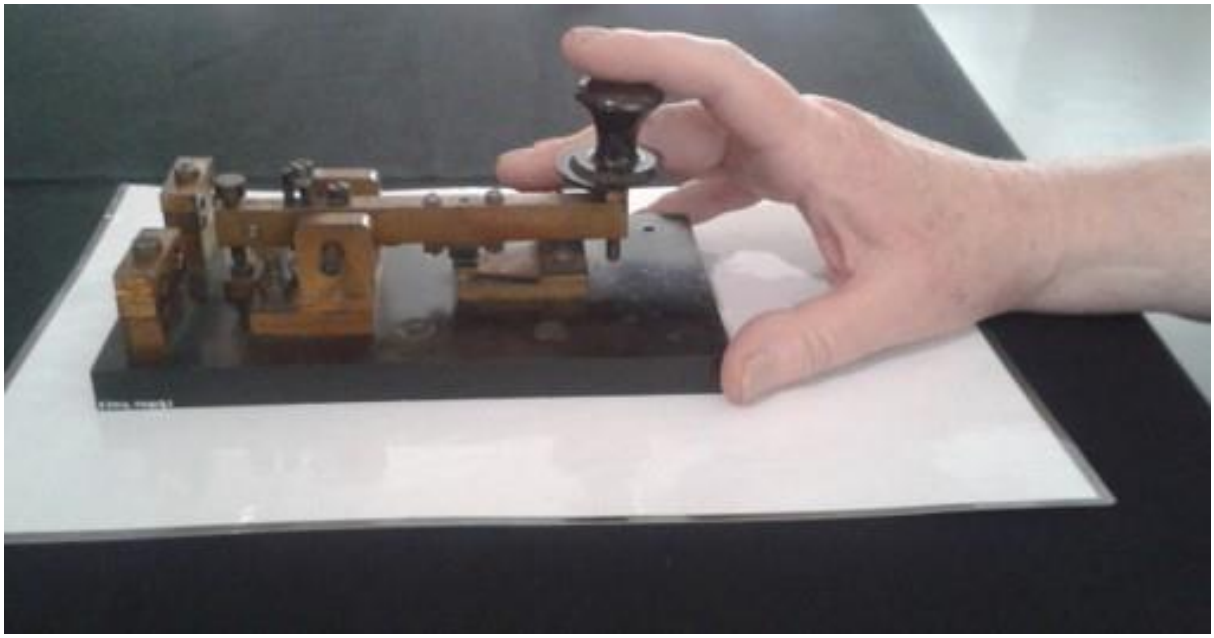

Figure 5-1 Post Office recommended posture for using a Morse key

Note the similarity to using a modern day computer mouse. (Photograph: authors personal collection).

Office, 1911).

[472] Health and Safety Executive, *Work with Display Screen Equipment (Display Screen Equipment) Regulations 1992, as amended by the Health and Safety (Miscellaneous Amendments) Regulations, 2002* (London: HSE Books, 2003).

[473] See Appendix 5, *Report of the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery Office, 1911).

Adopting a “good style of sending” was the prime message, with the caveat that poor style affected rapid working and was likely to cause fatigue and may even lead to telegraphists’ cramp. A total of seven instructions for good posture were provided, starting with sitting comfortably, moving on to hand and wrist posture and using optimum technique for using the Morse key. Another example of an innovative approach championed by the enquiry committee was the introduction of what in present day ergonomics terminology would be the concept of user equipment trials. Telegraphists from across Britain were asked to participate in evaluating different types of key (for example the American Vibroplex key), piano keyboard types (Hughes and Baudot machines), machine systems with a keyboard perforator and telephones. The trial continued during the enquiry, although no clear decision was reached

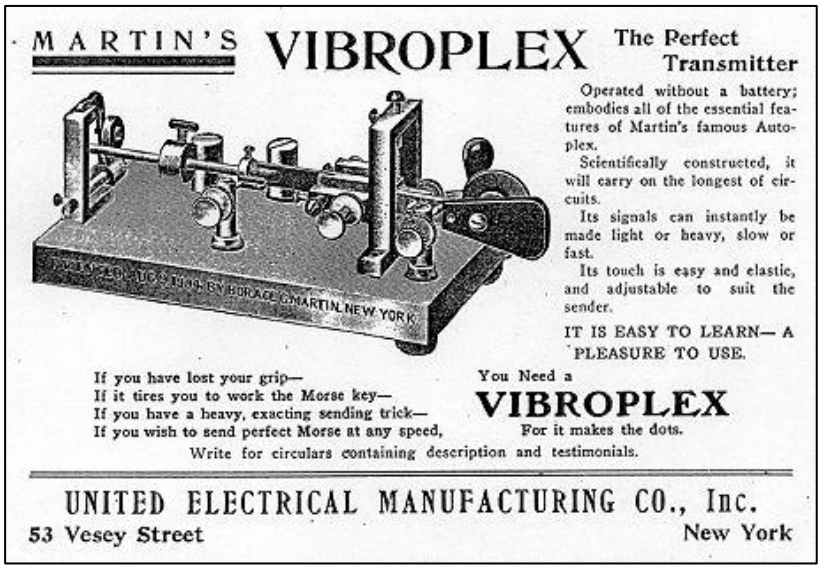

Figure 5-2 Advertisement for a Vibroplex key[474]

A second user trial took place with about 500 telegraphists asked to review and reach consensus on “best wrist position to adopt when using the Morse key”; the unanimous

[474] As advertised in the American journal *The Telegraph Age*, 1906, Vol 24: p x.

verdict was that a free wrist was needed for correct manipulation and movement. This is also reflected in present day guidance for using a computer mouse.[475]

As a further part of the discussion on telegraphy the committee undertook a horizon scanning exercise by looking to the future of telegraphy. There was already evidence building within the Post Office that semi-automatic machines (e.g. Baudot) could be used for heavy traffic circuits with telephone use for lighter ones.

Figure 5-3 Baudot telegraph machine

(Photograph: downloaded from Science museum website).[476]

As part of the modernisation of the Post Office as a twentieth-century business, a strategic approach that involved the concentration of traffic on the main telegraph routes using fast automated systems to main towns and cities, then onward distribution of telegrams by telephone was advocated. This would eventually make the Morse key redundant and the

[475] See Health and Safety Executive, *Work with Display Screen Equipment (Display Screen Equipment) Regulations* 1992.
[476] Images freely available from https://www.sciencemuseum.org.uk/objects-and-stories), last accessed 10/05/2019.

work role of the telegraphist would change to using keyboard perforators to type messages for delivery associated with telephones to send and receive. The committee stated their opinion that the work of a keying telegraphist was “already being invaded” and evidence from the CTO cited a 10% reduction in Morse work.[477] The recognition that change would occur as part of a process of modernisation and could have manpower consequences is familiar in the present day – one example might be the replacement of many manual office tasks with electronic mail and other systems.

As a result of the horizon scanning exercise, the committee expressed satisfaction that overall, the Post Office were at the forefront of new telegraph technology development. My interpretation of this is the establishment of a self-reflection and self-audit process to assure the quality of equipment and processes, again, a very modern process for an organisation in the first decade of the twentieth century. After presenting solutions to the Post Office for telegraphists’ cramp, the overall committee conclusion was that cramp was not attributed to a single cause, therefore changing one element would not resolve the problem. This was a plain message to the Post Office that cramp would continue to occur until total automation of the telegraph system. The recommendations were therefore not designed to be an instant and universal panacea to totally eliminate cramp, but the committee emphasised that the cumulative effect of adopting them should have a “marked effect on the incidence and prevalence of telegraphists’ cramp”. My interpretation of this is that the committee believed a multifactorial approach was the best strategy.[478]

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[477] In May 1909 CTO dealt with 195,000 Morse messages; by 1911 this was around 188,000. Baudot and other machine use increased by 10%. See *Report of the Departmental Committee on Telegraphists’ Cramp,* (London: His Majesty’s Stationery Office, 1911) p 32.

[478] See *Letter from S Paterson (Committee secretary) to Postmaster General’s Secretary,* POST 30/3400, File XXV (November 2nd, 1911), London: BT Archive. Extracts from the report were also published in *The Telegraph Chronicle* on December 22nd, 1911. *See* MSS.135/EU/5/10/30 (December 22nd, 1911), Warwick: Modern Records Centre Archive.

5.5 Implementation of the recommendations

Implementation of the recommendations was protracted and beset by resistance to change. Despite agreement of the report content by the whole enquiry committee, once it was published the Post Office and the PTCA again diverged in view. The archive evidence demonstrates that the recommended changes were not accepted readily by the Post Office departments and, in some cases, required longer term negotiation, for example the recruitment and training of suitable learners and the provision of suitable work equipment. An initial briefing report from the enquiry documents was prepared by secretary King. [479] This initiated protracted written correspondence which lasted for most of 1912 and primarily discussed the recruitment of learners from boy messengers, training facilities, supervision of learners, and altering of the role of telegraph surveyors.[480] The discussions focused on policy and procedures; as an example the Staff branch argued that the centralised learning schools in the larger towns would result in a two-tier system of training, with those in the smaller town disadvantaged because it would involve trainees travelling potentially long distances to larger towns. Even though a more streamlined learning process offered a potential opportunity to limit the future number of cramp cases, the time spent discussing the ramifications of the recommendations suggests that there was still no real desire for change or modernisation of staff procedures and practice. One possible conclusion I have drawn from this is that the far-reaching extent of the operational change required was viewed as too drastic for the organisation.

The PTCA approached the recommendations from a different perspective to their employers. Their focus was on the role of the telegraphist in the work system and the outcomes of

[479] The report was sent from secretary King to the Postmaster General, the Establishment and Staff branches. See the correspondence between the Postmaster General's office and the staff branch. POST 30/3401, File XXX1 (November 13th, 1911 to February 1912), London: BT Archive.

[480] See the discussions in the archive files discussing the enquiry recommendations. POST 30/3400, Files XXX1 (March 4th to August 27th, 1912), London: BT Archive.

contracting the disease rather than process and procedure for dealing with it. They also believed the Post Office were being too slow to implement the report recommendations and requested that a deputation should meet the Postmaster General and other Post Office managers with the objective of questioning implementation of recommendations of the enquiry committee report.[481] A meeting was agreed but further correspondence before the event indicates that the PTCA wanted to specifically discuss certain paragraphs in the report relating to: age limits for learners, entrance examination subjects, and instruction and teaching. However, at the meeting the PTCA also focused on the medical report to the enquiry and at the meeting with the Postmaster General expressed serious concerns that:

> Telegraphy is a highly dangerous occupation for it not only attacks a neurasthenic temperament or person with poor physique, but any Morse telegraphist may be affected.[482]

The PTCA were concerned with the long-term health effects of cramp on everyday life and how this reflected "the seriousness of the disease". The origins of this interpretation probably emerged from the changed medical definition of telegraphists' cramp from a peripheral to a central nervous system disease coupled with a strong belief that the Post Office should be more sympathetic to staff and not subject them to "excessive investigation", especially with the high working rates imposed by the Post Office. In addition to the health concerns, the PTCA challenged the other recommendations in the enquiry report they were concerned about. As one example, they believed the addition of typewriting to the entrance examination was erroneous as there "was no close affinity between typing and telegraphy". The Postmaster General countered that typing used different muscles to telegraphy and could

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[481] This deputation was requested by Ash (Chair), Tuck (General Secretary) and Mulholland (Vice chair) of the PTCA executive. Mr Davies who had been the PTCA representative on the enquiry committee was not involved. See POST 30/3401, Files XXX1 (March 12th 1912), London: BT Archive.

[482] See Meeting notes, POST 30/3400, File XXVII (April 1st, 1912), London: BT Archive.

provide relief for telegraphists with cramp, and that more typewriting keyboards were being used in the telegraph service. The PTCA challenged this interpretation, believing it to be a ploy to deny compensation. Individual working rates and targets for numbers of messages sent had always been a political issue for the PTCA and their members. The Post Office view was that operating averages were required to ensure that the telegraph business was operating economically, and they were office averages rather than individual work output rates.

Discussions with the PTCA and lack of agreement with their claims further confirms that in the first half of 1912, there was little initial support and some resistance to the findings of the cramp committee especially among those tasked with implementation of the recommendations. Later in 1912, the archive correspondence indicates some progress was being made towards implementation as if there was some realisation in the Post Office that changes in the telegraph service were inevitable.[483] Post Office middle management continued their "policy and process" approach to the recommendations with no further discussion or involvement of the PTCA. Although the "policy and process" approach was intended to be a suite of administrative measures to minimise the risks of cramp occurring, the belief eventually emerged that better work organisation would produce a more continuous work flow.[484] However, in terms of organisational response it indicates that if the Post Office were willing to implement changes to their processes, equipment and workplace environment, in the long term they would recoup the dual benefits of achieving a more modern work system as well as a healthier work force, as measured by a reduced prevalence of telegraphists' cramp. Further specific internal instructions were issued to progress implementation using a division of labour approach across the different sectors in

[483] The Postmaster General's secretary (King) wrote several memoranda to him during the last quarter of 1912, providing progress updates. See for example *Memorandum to the Postmaster General,* POST 30/3401, File XXXIII (October 22nd, 1912), London: BT Archive.
[484] Stated by King in *Memorandum to the Postmaster General,* POST 30/3401, File XXXIII (October 22nd, 1912), London: BT Archive.

the telegraph service.[485] An example of this is that the staff branch were asked to deal with recommendations III and IV, and the telegraph branch recommendations V and VI.[486] By January 1913, the PTCA had received a letter from the Post Office informing them of the implementation plans and also addressing the 1912 deputation concerns.[487] This was a straightforward factual briefing of the Post Office's forthcoming plans; it also addressed the deputation concerns of change of employment for telegraphists with cramp to include typewriting and a rebuttal of the PTCA earlier claims that telegraphists had been asked to speed up excessively.[488] With regard to the transfer of injured telegraphists to other roles, the Post Office confirmed that this would be done "without pay reductions as far as possible".

By early 1913, the implementation plans were still not fully enacted, nor problems resolved. For example, one group of employees in the telegraph service were the telegraph surveyors who were to assume enhanced roles and responsibilities, including more middle management and supervisory duties. These included training learners, rejecting those who displayed inaptitude and the putting in place of procedures to support monitoring learners and telegraphist work rates. The Post Office had immense difficulties deciding how to communicate these requirements to the surveyor staff. During January and February 1913, there were four consecutive draft Circulars of Instruction issued.[489] The lack of consultation on the wording of the Circulars, including the one to the Post Office Medical Officers, incensed the PTCA much as it had after the 1908 enquiry. Their next step was to request copies from the Postmaster General, who denied this on the grounds of being "confidential".

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[485] See communications from secretary King to the staff and telegraph branches, File XLI (November 14th, 1912), London: BT Archive.
[486] Recommendation III: summary of instructions to Post Office Medical Officers; recommendation IV: rejection of inaptitude in learners; recommendation V: training of learners and recommendation VI: organisation of work.
[487] See *Letter to the PTCA,* POST 30/3401, File XXXVIII (January 18th, 1913), London: BT Archive. The same letter was also sent to the UK Postal Clerks Association (in Manchester) and the Irish Post Office Clerks in Dublin.
[488] The Post Office stated that they had received no further evidence from the PTCA to justify this claim.
[489] See correspondence relating to *Surveyors Circular 101151/12,* POST 30/3401, File XXXIX (January and February 1913), London: BT Archive. The final version was printed in February 1913.

This seems an odd response given that the PTCA had been involved in the committee discussions on the future role of surveyors and that Samuel had been open with the PTCA on other issues.[490] The PTCA did not challenge this response; probably they were posturing out of political principle. It is likely that this information was probably available in their local telegraph office. In summary, the implementation of the enquiry recommendations was protracted. Post Office management took what I interpret as a systems organisational approach, one that focused on policy and procedures and overall telegraphy business, whereas the PTCA viewed the recommendations from the perspective of the physiological and health effects on the individual telegraphist in the work system and the consequences for these affected by cramp. However, when compared to the 1908 enquiry, Post Office management attitudes towards the telegraphists had changed. As time progressed after the years following the 1910 enquiry, management attitudes softened, and they were more accepting of telegraphists' cramp as an occupational disease even if some still doubted the motives of the PTCA. This is probably a consequence of Samuel's influence and his determination to resolve the telegraph problem as part of the business modernisation programme for the Post Office.

5.6 Analytical models for telegraphists' cramp

Whilst the remit of the 1911 enquiry was to investigate the prevalence and cause of telegraphists' cramp and means of prevention, a major outcome was an altered definition and perspective of the disease by the Post Office, therefore there is justification for further development of the analytical models. After the 1908 Industrial Diseases Committee, I propose that telegraphists' cramp was interpreted as purely a medical condition based on

[490] See correspondence between the PTCA and Postmaster General, POST 30/3401, File XLIII (March 7th and 20th 1913), London: BT Archive.

the diagnoses of signs and symptoms by the Post Office Medical Officers. Although Dr Sinclair had always acknowledged the importance of environmental factors in the aetiology of the disease, and the PTCA had identified the major elements of the workplace system as contributory ergonomic factors to the development of the disease, the sociopolitical context was singly focused on the compensation question. The organisational response by the Post Office to this was to delegate the diagnosis for compensation tasks solely to the Post Office Medical Officers. As proposed in Chapter 4, this defines Stage 1 of telegraphists' cramp as a musculoskeletal occupational disease.

After the 1911 enquiry, the medical definition of the disease changed to be one of multifactorial causation with an increased emphasis on defined multifactorial workplace environmental factors and their effects on telegraphists. It follows from this that a changed response to the disease resulted in a major contextual transformation where telegraphists' cramp became thought of in terms of the physiological and psychological responses of individuals to multifactorial work environmental factors, rather than just the signs and symptoms of the disease. This was important and possibly the first milestone in industry towards an understanding of work related musculoskeletal disease in the context of workplace ergonomic factors. This is evident from the enquiry recommendations on required physical changes e.g. alternative telegraph equipment, workstation space and suitable chairs. However, psychological factors such as work rates and work pressure were also prominent within the discussions because of the recognition of the nervous instability component of the disease and the possibility that existing telegraphists in post may have some inherent predisposition towards cramp. At this stage in the history of telegraphists' cramp, I propose that the accepted view of the disease changed from a medical interpretation stage (stage 1, discussed in Chapter 4) to that modified by the effects of identified multifactorial environmental factors. The Post Office organisational response to this

was to introduce procedural and work environmental changes. Stage 2 of the model is presented in Figure 5-4.

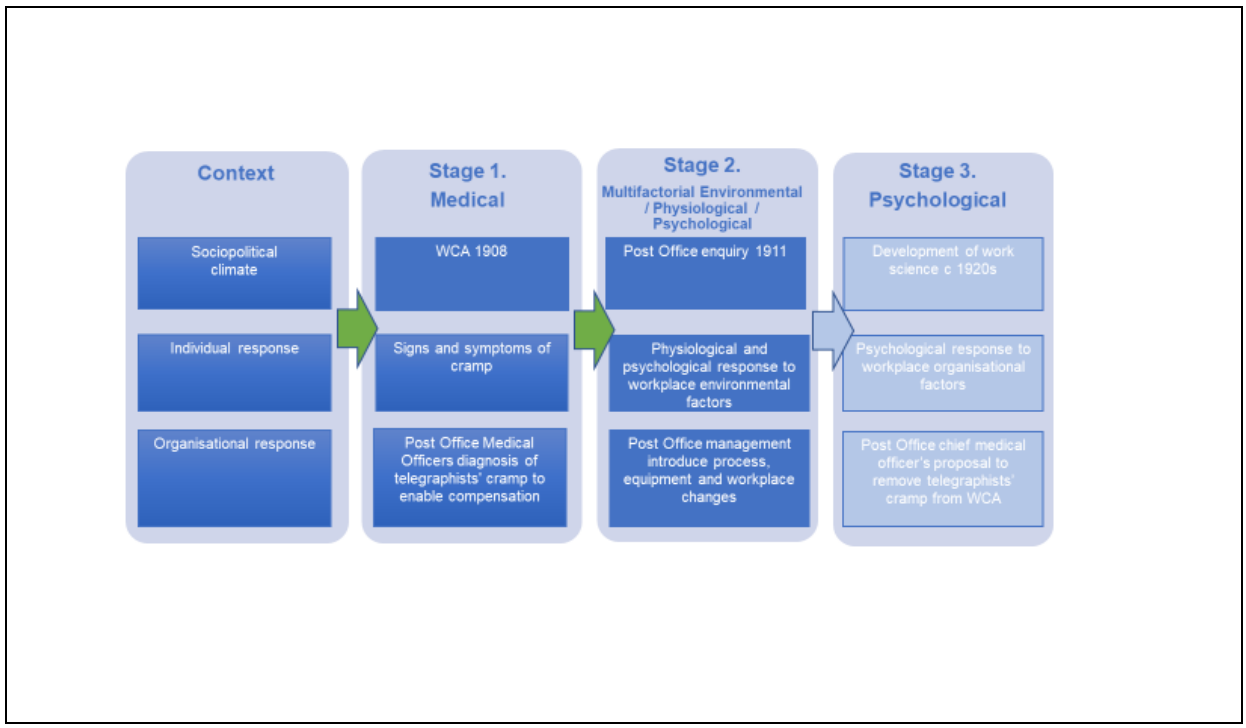

Figure 5-4 Stage 2 model for telegraphists' cramp as a musculoskeletal occupational disease

I have also updated the empirical mapping of the Fleck model for the telegraphists' cramp story, as different expert / lay groups emerged for the 1911 enquiry. The broad collectives that I first defined for the 1908 enquiry (see Chapter 4) were still in existence but were expanded to include other groups of staff internally within the Post Office (see Figure 5-5). Telegraphists' cramp remains as the disease objective at the heart of the model, although the key question I propose is not the disease and its existence but how the workplace factors moderate the development and management of the disease in affected telegraphists. The Fleckian model therefore evolved from that of 1908. The experts (the esoteric circle) can be visualised as the single group which formed the Department Enquiry Committee. Whilst the

constitution of the committee still included the PTCA, and doctors, it expanded to include Post Office management and telegraph engineering representatives. I argue that the committee functioned as a single expert body, although there was a division of labour to fulfil the enquiry tasks, to meet the goals of establishing prevalence and means of prevention of telegraphists' cramp.

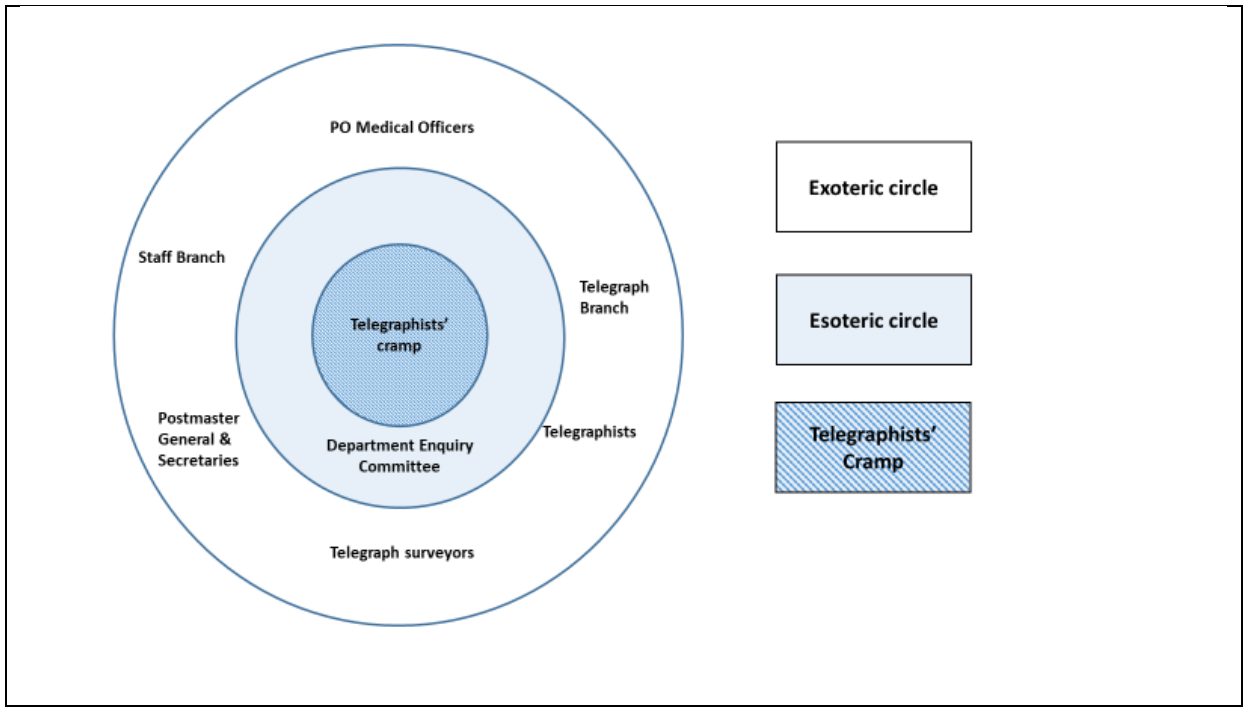

Figure 5-5 Fleckian mapping of telegraphists' cramp in 1911

The exoteric circle also increased in size both during and after the enquiry. The long duration of the committee and its way of working resulted in more opportunities for consultation and communication within and between the lay groups of staff within the Post Office.[491] The duration of the committee also favoured greater consolidation of, and interaction with the knowledge obtained and I suggest that the lay members of the exoteric circle could no longer ignore the presence and nature of the disease, although the archive evidence indicates that

[491] Especially compared to the 1908 committee which heard evidence only from the PTCA and Dr Sinclair. Of course, the 1908 committee had a much wider remit and examined many industries.

some staff at Post Office headquarters were still resistant and sceptical about telegraphists' cramp. The very detailed and clear nature of the final report with its several appendices and its availability within the public domain (e.g. Parliament, *The Lancet* and *The Telegraph Chronicle*) also made it impossible for the Post Office staff to reinterpret or misunderstand the evidence and conclusions presented to the Postmaster General.

5.7 Conclusion

After the first enquiry in 1908, sociopolitical relations between the PTCA and the Post Office had reached an impasse with lack of action from the Post Office, despite the persistence of the PTCA. The second enquiry into telegraphists' cramp during 1910 to 1911 introduced some innovative approaches to dealing with occupational disease in the workplace. The catalyst for this was the appointment of Herbert Samuel as Postmaster General. He was a Liberal reformer, but probably more importantly he had chaired the 1908 WCA and thus had heard the previous evidence on telegraphists' cramp, which had resulted in scheduling of the disease. The structure of the committee, mostly from internal Post Office staff, was a cross section of those involved with telegraphy (from middle managers to technical engineers), with Dr Sinclair and an external doctor (Dr Thompson) and external chair (Sir John Barran) to provide external visibility. The committee were delegated tasks, but decision making was based on a whole committee participatory review of the evidence gathered from the data sources. This was a new approach to a workplace health issue and a divergence from previous Home Office investigation committees.

The committee used a questionnaire which was sent out to the telegraphist workforce to establish prevalence of telegraphists' cramp from which data were gathered about health symptoms and work routines. Along with follow up investigations, this is a widely used

current day ergonomic methodology to investigate musculoskeletal disorders in the workplace. One outcome of this was a revised definition of telegraphists' cramp which took into account the wider effects of the work environment on the physiological and psychological response of the telegraphist and individual predisposition towards cramp. This approach extended the initial definition of the Post Office telegraph as a simple ergonomic system to a broader one encompassing the multifactorial causes for telegraphists' cramp which required multiple and different solutions. In turn this resulted in the identification of those workplace elements which affected the onset and progression of the disease, defined as a multifactorial approach, consistent with current practice in identifying risk factors for occupational musculoskeletal disorders.[492] If a single solution approach had been adopted for telegraphists' cramp, then the Post Office would have either dismissed or redeployed those affected as a single strategy for resolving the disease.

The implementation of two user equipment trials was also sanctioned as part of the enquiry. In the first, the telegraphists evaluated different types of key, machine systems and telephones; the second required telegraphists to reach consensus on "best wrist position to adopt when using the Morse key". The unanimous verdict on the second trial was that a free wrist was needed for correct manipulation and movement. This is also reflected in present day guidance for using a computer mouse.[493] There was already evidence building within the Post Office that semi-automatic machines (e.g. Baudot) could be used for heavy traffic circuits, with telephone use for lighter ones. As part of the modernisation of the Post Office as a twentieth-century business, concentrating traffic on the main telegraph routes using fast automated systems to main towns and cities, then onward distribution of telegrams by telephone was advocated as a strategic approach.

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[492] For a present-day approach to musculoskeletal disorders in the workplace, see for example IL Nunes retrieved from https://oshwiki.eu/wiki/Introduction_to_musculoskeletal_disorders, last accessed 10/05/2019.

[493] See Health and Safety Executive, *Work with Display Screen Equipment (Display Screen Equipment) Regulations 1992.*

In terms of modelling telegraphists' cramp as an occupational disease, the sociopolitical climate of the 1911 enquiry modified both the individual and organisational response to the disease. Telegraphists' cramp became thought of in terms of physiological responses of individuals to multifactorial work environmental factors, thus becoming the first time that work related musculoskeletal disorders were recognised as such in industry. The Post Office organisational response to this was to introduce procedural and work environmental changes. If the occupational disease model contextualises definition and process changes, the Fleck model accounts for the knowledge and experience gained and exchanges of dialogues between the defined esoteric and exoteric groups. Another noticeable change is the committee acting as a single joint expert body, compared to the 1908 enquiry where information exchange occurred within and between three interlinked but disparate groups.

6 The disappearance of telegraphists' cramp

6.1 Introduction

Occupational health reform in the workplace had developed to some extent as a result of the Liberal government welfare reforms of 1906 to 1914. However, one of the remaining major concerns was the poor health, fatigue and fitness status of the British working population. This was accentuated by the WW1 effort when there were great concerns about the chronic fatigue of munitions workers who were working excessively long working weeks (typically 75 to 85 hours).[494] With government recognition of the issue of WW1 productivity and efficiency, solving health problems in the workplace came to the fore. Against this background, in British industry there was the emergence of work science whereby scientific studies undertaken in the workplace focused on the interaction between workers and their work environment. The approach to understanding how humans interacted with their work environment changed radically with the processes adopted by the work science research boards. This had potential benefits for worker health and well-being.

The aim of Chapter 6 is to explain the disappearance of telegraphists' cramp in the period between 1915 and 1930. One of the workplace science initiatives that affected the Post Office was a scientific investigation of telegraphists' cramp published in 1927. I will analyse this as a main strand of the chapter.[495] The significance of the study and consequences for the Post Office will be examined as the study findings, along with medically reviewed cases of manipulative disabilities, contributed to a proposal by the Chief Medical Officer Dr H V

[494] See AJ McIvor, "Employers, the Government, and Industrial Fatigue in Britain 1890-1918", *British Journal of Industrial Medicine*, Volume 44, 1987, pp 724-732.
[495] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' cramp", *Industrial Fatigue Research Board,* Report 43, 1927, pp IV-48. (London: His Majesty's Stationery Office, 1927).

Prynne, namely that telegraphists' cramp should be excluded from the WCA.[496] This raised the possibility that the scheduling of telegraphists' cramp as a compensatable disease, an outcome that the Post Office Telegraph Clerks Association (PTCA) had struggled to achieve for so many years could be repealed. However, I will argue that by 1927 the advances in new automated technologies for telegraphy and increasing use of the telephone and typewriter were ultimately the main reasons for the disappearance of telegraphists' cramp.

6.2 The emergence of workplace science

The further development of work-based research programmes in the 1920s with their focus on scientific methods and prevention of ill health at work resulted in a change of attitude by the Chief Post Office Medical Officer (Dr H Prynne) towards dealing with cases of telegraphists' cramp. In this section of the chapter I will provide some contextual background on the organisations that conducted workplace research and the relationships between occupations and workplaces, which established person-centred research or the 'human factor'.

6.2.1 Government research boards

Workplace scientific studies carried out during WW1 were beneficial to the government and the munitions industry through attempts to maintain worker health and minimise the effects of fatigue.[497] Kreis suggests that the scientists undertaking these studies were:

[496] Dr HV Prynne, a former military doctor, assumed the role when Dr Sinclair retired in 1923.
[497] The HMWC primary objective was to find optimum working conditions which led to highest productivity while considering worker health and fatigue.

> a mixed bag of industrial psychologists, medical doctors, industrial hygiene and social researchers [who] discovered the relationship between the health and fatigue of industrial workers and industrial efficiency[498]

After WW1, the Health of Munitions Workers Committee (HMWC) that had been convened to solve fatigue by scientific experiments in the workplace was disbanded. However, the success of the HMWC prompted scientists who had worked on that research to lobby the government to establish a wider industry-based research organisation. The Home Office invited the Department of Science and Industrial Research (DSIR), created in 1915, and the Medical Research Council to convene a board to undertake further research into factors influencing fatigue in industry.[499] The outcome of this was the establishment of the Industrial Fatigue Research Board (IFRB), which was promoted and supported financially by the Home Office.[500] Much like the HMWC, the IFRB operated under the auspices of a committee comprising factory inspectors, industry directors, and academic physiology and psychology experts.[501] The primary role of the IFRB as cited in the McIvor papers, was to scientifically evaluate "the human factor in industry and particularly health and efficiency problems created by modern industry".[502] This approach positioned the human worker at the centre of the work system and thus the focus of the research investigations. In America, by contrast, work science was interpreted as an engineering analysis approach to work tasks to maximise industrial processes and tasks, known as Taylorism, which largely ignored the

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[498] See, S Kreis, "Early Experiments in British Scientific Management: the HMWC 1915 -1920", *Journal of Management History*, Volume 1 (2) 1995, pp 65-78.

[499] The DSIR was formed in 1915 and its primary aim was to fund university scientific research across a range of scientific disciplines. *The Lancet* published a report of its inauguration. See *The Lancet,* 1916, Volume 188 (4867) p 985.

[500] For a full account see, AJ McIvor, "Manual Work, Technology and Industrial Health, 1918-39," *Medical History,* Volume 31 (2) 1987, pp 160-189 and AJ McIvor, "Employers, the Government, and Industrial Fatigue in Britain 1890-1918", *British Journal of Industrial Medicine*, Volume 44, 1987, pp 724-732. The IFRB was known as the Industrial Health Research Board (IHRB) after 1928.

[501] The committee included Thomas Legge, head inspector of factories, CS Myers, a Cambridge psychology professor, and CS Sherrington, an Oxford Physiology professor.

[502] See, AJ McIvor, "Manual Work, Technology and Industrial Health, 1918-39," *Medical History,* Volume 31 (2) 1987, pp 165 -166.

human in the work system.[503] After the WW1 research experience, Britain was reluctant to adopt the Taylor approach initially, although "scientific management" did filter into industry from the late 1920s.[504] The documented mission of the IFRB as quoted by McIvor from its first annual report in 1920 was to:

> obtain exact facts about fatigue caused by industrial employment in different trades and under different conditions in the same trade.[505]

Over approximately the next ten years and under the direction of specific sub committees overseeing each research project, the IFRB published a series of individual reports documenting their research findings. These included studies of accident causation, the effects of repetitive work, vocational guidance and selection, factory heating and ventilation. As well as publicity in some medical journals, which also published summaries of some of the studies, the reports were freely available as HMSO publications.[506] Many of them were published in peer reviewed scientific journals, for example the work of Eric Farmer who later was one of the researchers in the 1927 telegraphists' cramp study. Farmer had an article summarising one of his reports, titled "Time and Motion Study" published in the *Journal of Industrial Hygiene* in 1922.[507] In the 1920s, the work of the IFRB changed direction – there was less work carried out on working hours and workplace environmental conditions and more focus on job design, work and labour organisation and vocational selection i.e. psychological rather than physiological nature of work.[508] This led to the creation of what

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[503] For a full account of Taylorism, see Rabinbach, pp 239-270.
[504] For a discussion of how Taylorism gained some foothold in Britain see M Kipping, "Consultancies, Institutions, and the Diffusion of Taylorism in Britain, Germany and France,1920s to 1950s". *Business History*, Volume 39(4), 1997, pp 67-83.
[505] AJ McIvor, "Manual Work, Technology and Industrial Health, 1918-39", *Medical History,* 31, 1987, pp 160-189.
[506] For example, The Lancet published a summary of the study on "The human factor in accident causation". See *The Lancet,* 1926, Volume 207, (5351) p 613.
[507] E Farmer, "Time and Motion Study", *Journal of Industrial Hygiene*, Volume 4, 1922 p 5.
[508] For a detailed account of this see McIvor, "Manual Work, Technology and Industrial Health", pp 160-189.

would today be termed as a 'spin off' organisation, the National Institute of Industrial Psychology.

6.2.2 The National Institute of Industrial Psychology

The National Institute of Industrial Psychology (NIIP) was formed in 1920 and its founders can be described as a subset of the IFRB Committee.[509] Professor CS Myers, a Cambridge psychology professor, was appointed institute director. It was not intended to be a direct competitor to the IFRB and different accounts of its formation provide varying explanations of its mission. For example, *The Lancet* reported it as "a national institute in the domain of physical sciences with a desire to be thought of as a counterpart to the National Physical laboratory".[510] After establishing itself, the NIIP probably received as much publicity as the IFRB, thus promoting its progress and credibility, especially among academic scientific journals. In 1921, the *Journal of Applied Psychology* reported the foundation of the NIIP as "an Association for Scientific Research", which would be supported by a scientific advisory committee of the heads of university departments "interested in the practical application of psychology and physiology" alongside "well known businessmen".[511] A few years later, an Australian journal reported the NIIP's success in workplace investigations, concluding:

> It may be that truly said of all the Institute's work, that its influence is far greater than can be measured by the mere increase of output recorded in numerous investigations that it has carried out, and it is hoped in time this will bear fruit in the acknowledgement on the part of industry, of the pressing need for wider research.[512]

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[509] They included Professor CS Sherrington, Dr L Hall and Professor EH Starling.
[510] See *The Lancet,* 1920, Volume 195 (5040) p 779.
[511] See "The National Institute of Industrial Psychology of the United Kingdom" *Journal of Applied Psychology,* Volume 5 (3) 1921, pp 290-291.
[512] See GH Miles, "The National Institute of Industrial Psychology", *The Australasian Journal of Psychology and Philosophy,* Volume III (4) 1925, pp 235-240.

The journal *Nature,* reporting on an NIIP meeting, noted that the NIIP was a body that would provide assistance to the "special needs of individual firms" and how this was "beyond the scope of a Board supported by public funds" such as the IFRB.[513] Archive evidence suggests that the NIIP did not view itself as a competitor of the IFRB, as exemplified by the cross exchange of knowledge and expertise between NIIP and IFRB scientists on collaborative industry projects.[514] As an example, both organisations produced reports on the provision of vocational guidance to prospective company employees and, later guidance on selection of staff for certain job roles.[515]

The NIIP also published its own journal, *The Journal of the National Institute of Industrial Psychology* in which it promoted the IFRB's research alongside its own. The research areas converged, and staff were used almost interchangeably between both organisations. In the later 1920s, the term 'human factor' gained more significance in published articles concerning both the NIIP and the IFRB. For example, in 1927 *The British Medical Journal,* in its review of the seventh IFRB report, mentioned the importance of 'investigating problems affecting the human factor in industry'.[516] By 1932 the NIIP had changed the name of its journal to *The Human Factor* and was working with a clearly defined set of objectives. These objectives spanned five work areas:

- Industrial investigations (working conditions, fatigue, production control)
- Personnel work (selection of staff, training)
- Vocational guidance (careers advice for young people)

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[513] See "The National Institute of Industrial Psychology"*, Nature,* 2706 (109), 1922, pp459-460.
[514] McIvor notes "that there was complete cooperation and free interchange of investigators" between the two organisations. See "Manual work, Technology and Industrial Health", p 174.
[515] As examples of this see E Farmer and B Muscio, "Three Studies in Vocational Selection", *IFRB Report* no.16, and WS Raphael and GH Roberts, "The Selection of Telephone Operators"*, The Human Factor,* Volume VI (11)1932, pp 398-412.
[516] See *The British Medical Journal,* 1927, Volume 2 (3472) p143.

- Research (industrial / vocational issues)
- Education (lectures and training courses) [517]

Although there was clearly a broadening of their remit (for example to include human resources issues), the focus was very much on the psychology of the individual in the workplace.

The IFRB and the NIIP had substantial influence in the 1920s and 1930s in establishing factors affecting individuals in the workplace and, workplace psychology, especially in areas and sectors where the British economy was expanding. A contemporary review of NIIP activities suggests that it achieved highest prominence in the interwar period. This was from a combination of political and commerce engagement involving royalty, high ranking government members (e.g. Baldwin and Churchill) and companies such as Cadbury, Rowntree and Debenhams actively promoting and funding the work of the NIIP.[518] However McIvor argues that the influence of both IFRB and NIIP was regional with most impact on the new manufacturing industries of the south east of Britain such as food processing and plastics manufacturing, where new technology was being harnessed to drive manufacturing.[519] In the late 1920s and early 1930s, although the Post Office was employing the latest technologies to automate telegraphy and could therefore be viewed as a progressive company, its telegraph service was struggling financially as well as having the legacy of telegraphists' cramp among its workforce.[520]

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[517] These were printed at the beginning of every published edition of *The Human Factor* journal.
[518] Between WW1 and WW2, the importance of psychology for individuals, industry and commerce was promoted through early radio broadcasts. Many companies also wanted to be seen as supporting the NIIP, hence the financial support provided. See R Kwiatokowski, DC Duncan and S Shimmin, "What Have We Forgotten and Why?" *The Journal of Occupational and Organizational Psychology, Volume* 79, 2006, pp 183-201.
[519] See McIvor "Manual Work, Technology and Industrial Health", pp 179-182.
[520] For a detailed account of the demise of the Inland Telegraph Service see JL Kieve, *Electric Telegraph, A Social and Economic History* (Newton Abbot: David and Charles, 1973), pp 248-256, and A Clinton, *Post Office Workers: A Trade Union and Social History* (London: George Allen and Unwin, 1984), pp 282-287. The government Committee on the Inland Telegraph Service also provides further background. See *Report on the*

6.3 The study of telegraphists' cramp as an occupational neurosis

The study of telegraphists' cramp published in 1927 resulted in a change of thinking about the origin and nature of the disease, by defining the disease as one that was wholly of psychological origin and contracted by telegraphists with what the researchers defined as "psychoneurotic characteristics".[521] My analysis of the report will demonstrate how this claim originated, substantiated by experimental data and the conclusions drawn from the report data.

The IFRB became involved with the Post Office in the 1920s, when the IFRB undertook a major scientific study of telegraphists' cramp. The rationale and motivation for this work is obscure. There is no evidence to suggest the Post Office specifically commissioned it, so it might have been part of a more general work programme of industrial research, as there were no documented specific terms of reference or objectives for the study documented. For example, *The Lancet* commented in 1925 that the IFRB's activities involved problems of "wide industrial importance" and cited research areas such as machinery design, illumination for the printing industry, ventilation and telegraphists' cramp.[522] Neither are there specific details within the BT Archive, although some correspondence from 1923 suggests the Postmaster General's staff were aware of it. This is evident from a series of exchanges between the Post Office and the Union of Postal Workers (UPW), who succeeded the PTCA. The UPW general secretary questioned whether the Post Office were undertaking any "systematic investigations" of telegraphists' cramp, to which the response was "the

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Committee on the Inland Telegraph Service (London: His Majesty's Stationery Office, 1927).

[521] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' Cramp", Industrial Fatigue Research Board, Report 43, 1927, pp IV-48. (London: His Majesty's Stationery Office, 1927).

[522] See "The Human Machine", *The Lancet*, 1925, Volume 205, (5310) p1196.

investigation by the IFRB".[523] In a commentary article *The British Medical Journal*, Dr Prynne is mentioned as being part of the [steering] committee for the study of telegraphists' cramp. There were three IFRB researchers involved with the study: Miss May Smith, Mr Eric Farmer and Dr Millais Culpin.[524] As their skills and expertise were in psychology, it was perhaps inevitable that the Post Office study would offer a psychological perspective on telegraphists' cramp against the wider background of applying psychological methods to workplace investigations.

As an introduction to the study the researchers reinterpreted the 1911 Department Committee on Telegraphists' Cramp report.[525] Given the background of the researchers it was likely that this review would reflect a strong psychological bias, which also included a language analysis of the 1911 report terminology. As an example, the terms "neurasthenic telegraphists", "nervous condition" "highly strung disposition" were highlighted. Taken out of context these labels would indeed emphasise the nervous aspects of the disease and would not provide the report reader with a balanced and accurate reflection of the 1911 enquiry findings.[526] This reinterpretation was justified by referral to recent psychological research that had demonstrated that "nervous temperament and highly strung disposition were indicative of types of persons known as psycho-neurotic". This reinterpretation of the 1911 findings

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[523] See the correspondence between the UPW and the Post Office regarding the case of Miss F McHale, See POST 30/3402, File LXIII (August 23rd to December 1923), London: BT Archive.

[524] May Smith and Eric Farmer were psychologists. According to Thomson, May Smith was a teacher who became interested in psychology. She was first employed by the IFRB to undertake research in the female laundry trade, where she undertook laundry tasks to understand the job. She was a member of a suffrage society and interested in social reform who continued to focus on women and work. See M Thomson, Psychological Subjects: *Identity, Culture, and Health in Twentieth Century Britain* (Oxford: Oxford University Press, 2006), p 148. Dr Millais Culpin MRCS, LRCP, was a surgeon and anaesthetist who had qualified in London in 1902 and who, by 1927, was a lecturer in psychoneurosis at the London Hospital. Dr Culpin published many articles in both *The Lancet* and *The British Medical Journal*. For examples, see "The Psychological Aspects of the Effort Syndrome", *The Lancet*, 1920, Volume 196 (5056) pp 184-186, "The Conception of Nervous Disorder", *The Lancet*, 1930, Volume 216 (5310) pp 1383 -1387.

[525] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' cramp", *Industrial Fatigue Research Board,* Report *43, 1927*, pp IV-48. (London: His Majesty's Stationery Office, 1927).

[526] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' Cramp", pp 1-2.

reflects the psychological approach that work scientists were using in general in this time period.

The methodology of the study related to three objectives and was defined in three parts: physiological testing and interviews of subjects, examination of telegraph learners and an examination of a comparative group of clerical (civil service) workers. The study findings were summarised and conclusions drawn. In the first part, whilst the testing apparatus and procedures were discussed in detail, there were no details of the telegraphist subjects such as the size of the samples, where they worked and their duties, although the subjects were divided into two groups: "those certified as suffering cramp" and "a group carrying on efficiently".[527] I propose that this designation implies that the researchers were keen to label cramp as an inefficiency rather than medical problem early in the study. Three experimental procedures were used on all subjects:

- A "pressure exerted" test
- Ergograph test
- McDougall-Schuster dotting test

The first two of these measured finger pressures exerted with the ergograph also measuring the number of contractions and their magnitude to calculate working speed. Both were more sophisticated recording techniques of Fulton's tests carried out in 1884.[528] The third test was "for the purpose of testing voluntary attention and muscular control", a hand-eye coordination test in effect, where the subject had to mark with a pencil a slowly revolving paper disc of pre-printed dots. From the test results, the subjects were divided by performance into four

[527] Later in the report it mentions that there were 41 cramp cases and 46 non cramp cases. See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' Cramp", p 21 and p 33.
[528] See Thomas Wemyss Fulton, "Telegraphists' Cramp", *The Edinburgh Clinical and Pathological Journal,* 1884; Volume 1 (17) pp 369-375.

groups, ranging from “best to weakest” although how these criteria were defined appears to be arbitrary rather than referenced to any normative data. The researchers were collecting physiological measurements and assigning a psychological interpretation to the empirical data. The groups of telegraphists in the study were also interviewed for their opinions on the causes of cramp. This did not reveal any new or different findings to those of the 1911 committee. The interviews were also used to classify the types of disability arising from cramp in terms of those who had general disability using their arm, those who could not send or receive but could use their arm for other tasks and, those who could not send a particular group of letters. This classification completely overlooked medical signs and symptoms, nor did it consider the effects of fatigue. The researchers suggested “fear of cramp” as a factor involved in triggering attacks of muscle spasm, assigning a further psychological explanation for cramp. This was followed by what would be interpreted today as a psychosocial analysis of an individual and their relationships in the workplace, although it was labelled by the researchers as a “medical study of emotional differences”.[529] All the qualitative data collected by interviews was then used to justify the personality types of the telegraphists. In part two of the study, one hundred telegraphist learners were tested physiologically using the same test methods as the cramp subjects and also examined “with reference to the presence or absence of psychoneurotic symptoms”.[530] The subjects were divided into groups as “those with no [cramp] symptoms” and “an intermediate group at the extremes of psychoneurotic and normal”. The latter group were further qualified as “[those] whose liability to breakdown will in all probability be determined by the environmental conditions of their life and work”. This was some recognition of the effects of the workplace environment on symptom development and acknowledgement of the multifactorial nature of telegraphists’ cramp, although this argument did not persist in the remainder of the report. The third part of the study compared other groups of clerical workers in the civil service (who were not specified)

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[529] See Smith, Culpin and Farmer, “A Study of Telegraphists’ Cramp”, p16.
[530] See Smith, Culpin and Farmer, “A Study of Telegraphists’ Cramp”, p24.

to the telegraphists. By this time in the report account the term “psychoneurotic symptoms” was firmly embedded and used with “[lack of] muscular efficiency” to frame and label the cramp condition.

The overall study conclusions were that, whilst cramp subjects had varying degrees of “muscular weakness”, the majority had “severe psychoneurotic symptoms” manifested as being “nervous and highly strung”. The researchers hypothesised that such telegraphists were more likely to break down due to the demand of the occupation, when compared to general clerical workers. They proposed that:

> the exacting nature of the work and inevitable rigidity of the [working] conditions, the isolation of this one symptom [cramp] with its known disabling effects have all operated to concentrate attention into this channel. [531]

From this a general predictive conclusion was extrapolated that for occupations where disability might occur to a part of the body specifically used for defined work activities, the workers most affected would most likely be those with psychoneurotic symptoms. This conclusion just stopped short of identifying the potential effects of repetitive work activities using the same muscle groups as one factor in the development of occupational cramps. The researchers instead, interpreting the development of cramp as the result of a psychological rather than physiological response. Although the study drew conclusions about the potential for disability resulting from psychoneurotic symptoms it did not provide the Post Office with any new recommendations on employment of new recruits to telegraphy with psychoneurotic symptoms that had already been identified. In fact, establishing potential

[531] See Smith, Culpin and Farmer, “A Study of Telegraphists’ Cramp”, p36.

psychological symptoms had already been included within the 1911 Committee recommendations as part of the new entrants' medical examination.[532]

Both *The Lancet* and *The British Medical Journal* carried editorial reports on the telegraphists' cramp study and offered different perspectives.[533] *The Lancet* suggested the study took a "modern approach to the problem of this occupational neurosis" and reported in some detail the tests and results. The article concluded that young people showing psychoneurotic symptoms should not take up telegraphy and advocated that when cramp was diagnosed the emotional state of the patient must be considered. *The British Medical Journal* editorial article which was much shorter in length, adopted a more measured tone. It focused on how the devised tests could be used as an aid to vocational selection for those wishing to train as telegraphists. It also commented that the study "did not offer any advances in prevention of the disorder". Further research work by Dr Culpin was reported by *The British Medical Journal*, in which he used the telegraphists' cramp study data as part of a paper presented to the Psychiatry section of the British Medical Association.[534] Dr Culpin investigated the relationship between occupation and incidence of psychoneurotic illness and reviewed sickness records from government departments and private companies. The conclusion was that disabilities from minor psychoses were causing large amounts of lost working time in industry, and job satisfaction was cited as an important factor, although the origin of this was not explained. How these minor psychoses were diagnosed was not evident, but nevertheless this was a forerunner of work-related stress, well recognised in today's workplace.[535]

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[532] See Recommendation III: summary of instructions to Post Office Medical Officers, *Report of the Departmental Committee on Telegraphists' Cramp*, (London: His Majesty's Stationery Office, 1911).
[533] See the editorial reports of this in *The Lancet,* 1927, Volume 210, (5427) pp 510-511, and *The British Medical Journal,*1927 Volume 2 (3479) pp 462-463.
[534] See Dr Culpin's report in *The British Medical Journal,*1927 Volume 2 (3494) p 1186. There was no information provided about the number of companies or sickness records examined,
[535] The UK Health and Safety Executive currently report in excess of 11 million days are lost at work each year as a result of stress at work. See http://www.hse.gov.uk/stress/ last accessed 10/05/2019.

The telegraphists' cramp study was severely flawed in several respects, especially when compared to the detailed and methodological finesse of the 1910 study used by Drs Sinclair and Thompson to establish prevalence of telegraphists' cramp. In the 1927 study, there is no information regarding the timescale of the study or its duration, although from earlier Post Office correspondence it was either being planned or had started in 1923. That it was published four years later implies a longer duration of experimental data collection, although there is no information to support this. There is little background information on the demographics of the telegraphist sample used in the study, for example how they were selected, where they were from, the age group, or how closely the "control group" were matched to the cramp group. The criteria for selection of the cramp cases is unclear, apart from them being "certified" as having cramp, presumably by a Post Office Medical Officer. Whether these cases were longstanding is also unknown. From the outset, the report analysis of the 1911 Committee findings places heavy emphasis on the psychological aspects to the exclusion of the other issues deemed important by the Committee, e.g. fatigue, working routines and equipment used, providing a strong impression of researcher bias.

The use of physiological testing interpreted in terms of psychological factors is not surprising given the high profile of work science and psychology at work in the 1920s. Analysis of the study of telegraphists' cramp demonstrates the strong influence both the IFRB and NIIP in the 1920s, and the focus on work psychology, understandable given that many of the researchers were psychologists. Thomson suggests that the rise of workplace psychology occurred as part of a wider reform of 'industrial economic thinking and practice' and to 'rescue workers from tyranny of the machine' but also proposes that the impact of this was limited on improving worker welfare. Nevertheless, Thomson argues that using workers as psychological subjects resulted in a consideration of workers' needs, defined as a humanistic

or user-centred. This approach led to a progression from sole consideration of industrialisation and technology to one that considered the workers in industrial systems. [536] Scrutiny of IFRB and NIIP reports at this time reveals the focus was very much on vocational guidance and the psychology of the individual in the workplace. However, Dr Culpin's later use of the telegraphists' cramp study and other data to investigate days sickness in the workplace from what he termed "minor psychoses" also represents a new consideration of the effects of psychological factors on workers' health and concepts of stress.[537] Interest and research in stress originated from physiological studies in which the impact of environmental factors on emotional and physical health were examined, largely through the work of Walter Cannon in America in the 1920s and Hans Selye's work on "General Adaptation Syndrome" - the body's physiological responses to external agents such as shock, injury and fatigue.[538]

6.4 Telegraphists' cramp in the Post Office during the 1920s

This section will examine possible reasons for the decreasing visibility and disappearance of telegraphists' cramp within the Post Office in the 1920s. There were several contributing factors. The main factor was the advances in telegraph technology resulting in decreased use of the Morse key which, when taken with the lessening power and interest of the trade unions and fewer Post Office management decisions and activities relating to telegraphists' cramp. This resulted in a lower incidence of new cases and reduced visibility of the disease. Against this background, the advances in work science and industrial psychology were also

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[536] See M Thomson, *Psychological Subjects: Identity, Culture, and Health in Twentieth Century Britain* (Oxford: Oxford University Press, 2006), pp 140-142.

[537] See M Culpin, "Incidence of the Minor Psychoses", *The British Medical Journal,*1927 Volume 2 (3494) p 1186. Stress theories were initially developed to explain the human reaction to acute physiological stresses which could threaten biological survival. Later the term stress became associated with mental health issues in the workplace. For an account of the emergence of stress theories see R Karasek and T Theorell*, Healthy Work - Stress, Productivity and the Reconstruction of Working Life*, *(*USA, Basic Books, 1990), pp 85-89.

[538] For an account of the work of Cannon and Selye, see M Jackson, *The Age of Stress - Science and the Search for Stability* (Oxford: Oxford University Press, 2013), pp 56-99.

a major consideration, specifically the 1927 study findings, which influenced Dr Prynne, the Post Office Chief Medical Officer, to propose that the disease should no longer be scheduled as an occupational disease.

Through its years of operation, the PTCA had been persistent parliamentary lobbyists, especially in the early 1900s with their Parliamentary Committee reporting on a range of issues relating to pay, working conditions and as discussed above telegraphists' cramp. The PTCA merged with the United Kingdom Postal Clerks Association (UKPCA) during the WW1 years and just after (1914-1919) to become the Postal and Telegraph Clerks Association (P&TCA). After 1919, the telegraph workers became part of the much larger Union of Postal Workers (UPW), which existed until 1982.[539] As a result interest in the telegraphists and representation of their issues would effectively be absorbed into a much larger body of workers. Following the success in the 1908 and 1911 enquiries, the PTCA interest in telegraphists' cramp decreased possibly through less interest by the PTCA executive as well as WW1 when many telegraphists were called to military service. Archive evidence demonstrates much less interaction and communication with Post Office management on the subject, apart from pursuing fairness of treatment for longstanding individual cases of cramp for pay and grounds for compensation, and later when there were telegraph staffing problems during WW1.[540] There was a recurrence of discussion of retention of pay grade for telegraphists with cramp who transferred to other job roles within the Post Office as part of renewed discussions about pay and working conditions.[541]

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[539] Clinton provides a comprehensive account of the Post Office trade unions and their activities. See A Clinton, *Post Office Workers: A Trade Union and Social History* (London: George Allen and Unwin, 1984), pp 321-388.
[540] As an example of the compensation discussion, see the correspondence between the PTCA and Government treasury, POST 30/3401, File XLIV (March 7th and May 5th, 1913), London: BT Archive.
[541] This emerged from the 1912 to 1913 Holt Committee investigation into Post Office workers wages and working conditions. See POST 30/3401, File XLV (January 18th and March 20th, 1914), London: BT Archive.

WW1 affected the telegraph service, especially in the Central Telegraph Office (CTO) where some 1300 senior telegraphists were recruited for military service. This resulted in the workload being distributed between female and junior telegraphists some of whom subsequently reported cramp related symptoms and were moved to non-Morse Key duties, thus creating further staff and workload management problems for the CTO controllers.[542] This situation also resulted in correspondence from Post Office management fully supporting the premise that junior staff should not work excess hours, creating further staffing problems for the Controllers. Union activity and interest in telegraphists' cramp resurfaced when the Post Office Secretary's office requested from CTO details of the work duties of young female telegraphists with less than 5 years' service, as they had been made aware of an increase in "arm troubles".[543] In this instance the chain of communication was from the Post Office downwards to CTO; in previous years it was reversed i.e. from the staff upwards to Post Office management. This evidence suggests there was sensitivity amongst Post Office management towards telegraphists' cramp, probably as a result of the previous history of the disease in the organisation.

The telegraph service had always operated at a financial loss within the Post Office, but by the early 1920s, advances in technology resulted in the replacement of Morse and Baudot systems by the telephone.[544] To reduce costs the Post Office introduced teleprinters and more multiplex systems in the belief they could streamline the business and save manpower costs, along with batching telegram delivery as a cost saving measure.[545] However these

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[542] Dr Sinclair reported female telegraphists as suffering from neuritis, see POST 30/3402, File LI (28th October 1915), London: BT Archive. See also the correspondence between the CTO controllers and Post Office management, POST 30/ 3402, File LIII (October 16th to December 7th, 1916), London: BT archive.

[543] See *Letter from Post Office to John Newlands* CTO controller, POST30/3402, File LVI (September 19th, 1917), London: BT Archive.

[544] Kieve estimates that inland telegraph traffic reduced from 69 to 47 million between 1904 and 1927 and that the use of telephones increased from 1.12 million in 1914 to 2.35 million in 1935. See JL Kieve, *Electric Telegraph,* pp 248 -256 for a full account of the decline of the telegraph service.

[545] Teleprinters worked by a sending operator typing a message which appeared as a typed slip at the receiving end. Multiplex circuits could process 8 telegrams (4 send and 4 receive) per circuit, with messages being created

measures were small compared to the staff costs associated with an ageing workforce, 70% of whom were on the maximum pay within their job grade. In 1927 an enquiry was set up by the Post Office with the purpose of "effecting substantial economies in the inland telegraph services" and consisting of external private sector high profile businessmen, tasked with the aim of providing an unbiased perspective on a government organisation.[546] The findings highlighted the main problem as internal competition from the telephone system, which resulted in the telegraph service being thought of within the Post Office as a "diminishing business" resulting in "staff inertia". The recommendations included: reducing the number of telegraphist supervisors, downgrading the status of telegraph work and most significantly, for telegraphists' cramp, stopping the excessive rotation of duties.[547] The latter recommendation would have proved highly contentious during the peak years of Morse key use, but because of the newer technologies being used for telegraphy, this was no longer deemed to be a problem. However, the UPW declared the report to be a "mean and spiteful attack on [telegraphist] staff".[548] A second committee chaired by Lord Simon convened in 1929 proposed further changes. Their findings, which included abandoning old equipment (including Morse keys) and the launch of the "greetings" telegram were more palatable to the UPW.[549]

On Dr Sinclair's retirement as Chief Medical officer of the Post Office in 1923, he was succeeded by Dr Harold Prynne a former military doctor.[550] Archive evidence indicates that Dr Prynne became involved in long standing individual cases of telegraphists' cramp throughout the 1920s and, shortly after commencing employment, was designated by the

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by a typewriter or Baudot machine.

[546] The committee were Sir SH Lever- president of Dunlop rubber, Sir H McGowan – President of ICI and Daily Mail and, Lord Ashford, director of London Underground.

[547] See the *Report of the Committee on the Inland Telegraph Service,* (London: His Majesty's Stationery Office, 1927).

[548] See Clinton, *Post Office Workers* p 284.

[549] For a fuller account of this committee see Clinton, *Post Office Workers*, pp 284-285.

For a biography of Dr Prynne, see https://livesonline.rcseng.ac.uk/biogs/E005291b.htm , last accessed 10/05/2019.

Postmaster General's Office as having "a special interest in telegraphists' cramp" similarly to Dr Sinclair. In one particular case of cramp Dr Prynne's decision was that the symptoms presented were "outside the scope of the cramp definition of 1911". This incensed the UPW, who argued that the 1911 definition was "obsolete", but Dr Prynne remained firm that this would be used "in the absence of anything else".[551] By 1927, the doctor had investigated more than three hundred cases of telegraphist's cramp with what he termed "manipulative difficulties" over the previous six years. He suggested that this was due to:

> physical impairment or degree of anxiety neurosis and that its connection with telegraphy is largely accidental since the disability is merely a local expression of the underlying psychoneurosis[552]

Dr Prynne had been a member of the steering committee for the 1927 telegraphists' cramp study. Quite how much influence the committee discussions and study outcomes had on Dr Prynne is not documented, but it is reasonable to conclude that there was a strong exchange of opinion at committee meetings. An outcome of this was that within four years Dr Prynne generated a new medical interpretation of telegraphists' cramp - one that aligned with the workplace psychology view of occupational disease and also the Culpin and Smith IFRB report. This was followed by a request from Dr Prynne to the Postmaster General, based on his findings and the IFRB report, that the government Treasury Department should make a decision regarding whether telegraphists' and writers' cramp should continue to be included in the third schedule of the WCA.[553] This elicited a cautious response from the Postmaster

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[551] See the correspondence relating to the case of Miss F McHale, POST30/3402, File LXIII (August 3rd to August 23rd, 1923), London: BT Archive.
[552] This appears as part of a case review of a female telegraphist who was diagnosed as suffering from neurosis rather than telegraphist' cramp. See Report by Dr Prynne, POST30/3402, File LXVIII (September 1st, 1927), London, BT Archive.
[553] See *Letter from Dr Prynne to Post Office management*, POST30/3402, File LXVIII (November 10th, 1927), London: BT Archive.

General's office.[554] The Post Office were clearly concerned about the legal liability of removing telegraphists' cramp from the third schedule of the WCA. The issue at stake was that legal decisions on previous cases of cramp had depended on the balance of medical opinion from both sides contesting the claims. The Post Office therefore took a political decision not to support Dr Prynne's request without further definite medical consensus on the nature and causes of telegraphists' cramp. I argue that whilst this indicates continued government support for compensation, one interpretation is that there was still doubt about the new psychology of telegraphists' cramp by Post Office management. Dr Prynne made no further requests to open the discussion and telegraphists' cramp remained a compensatable disease whose legacy remains to the present day when "severe cramp of the hand and forearm" is a reportable occupational disease, although the compensation process today operates as a personal injury claims system.[555]

Although the disappearance of telegraphists' cramp through the 1920s as an occupational disease was the combination of several factors discussed above, the implementation of new technology on the telegraph service and consequent decline in Morse key use was probably the most significant. Whilst this would not mitigate against the existing and often longstanding cases of cramp, it would certainly lessen the chances of the development of cramp in newer entrants to the telegraph service. Although the trade unions in the Post Office were still strong and active, after the amalgamation to form the UPW there would always be less focus on the telegraphists as a separate group within the union because of the sheer numbers of staff now included within the union's membership. They however did continue to represent individuals with cramp, although their influence was far removed from the days of the PTCA parliamentary committees and their political lobbying of government

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[554] See M*emorandum from Post Office management*, POST30/3402, File LXVIII (March 1928), London: BT Archive.

[555] See 'The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013'. Available from http://www.hse.gov.uk/riddor/occupational-diseases.htm, last accessed 10/05/2019.

and Post Office management. My review of the archive records indicates there was much less communication between the UPW, Post Office management and the telegraphists throughout the 1920s than previously. Ultimately this would contribute to a loss of visibility of the disease, especially with newer and younger staff being employed for telegraphy. There is little doubt that workplace science and psychology and the 1927 study influenced Dr Prynne to propose a new definition of telegraphists' cramp, but there is no evidence to substantiate how this new framing of the disease affected the incidence of cramp. One outcome of this new definition was that in the future new or younger telegraphists developing symptoms after prolonged Morse key use, would not be medically diagnosed as suffering from telegraphists' cramp. This would also contribute to the loss of visibility of the disease.

6.5 Analytical models for telegraphists' cramp

The 1911 enquiry into telegraphists' cramp had resulted in a changed definition of the disease. It was now regarded as caused by many factors, its development influenced by defined multifactorial workplace environmental factors and their resulting physiological response from telegraphists. As I proposed in Chapter 5, this was a significant milestone for the Post Office leading to an understanding of work-related musculoskeletal disease in the context of workplace ergonomic factors. Within the sociopolitical context of the enquiry, the changed definition enabled proposal of Stage 2 of the model, one that incorporated the physiological response to workplace environmental factors and the Post Office organisational response to introduce procedural and work environmental changes.

In the 1920s the creation of the IFRB and the NIIP developed workplace science with tools and techniques to modernise industry thinking about investigation and prevention of ill health at work. Their research gained a high profile amongst the industrial and medical

communities. In turn, this approach was filtered down to the Post Office. The 1911 enquiry had included individual predisposition (nervous instability) as part of the definition of telegraphists' cramp and recognised it as one factor in the development of the disease. However, the study of telegraphists' cramp published in 1927 concluded that the disease was an occupational neurosis, but one that was based on the psychoneurotic state of the individual telegraphist. This conclusion about telegraphists' cramp changed the context of the disease from that of a physiological-workplace environmental entity with the potential to affect the whole telegraphist population to one that focused heavily on the psychological status of the individual. This was set against the background of the sociopolitical climate of work science and the interest in workplace psychology. The organisational response to this by the Post Office was primarily by Dr Prynne, who proposed that the study findings provided scientific evidence that justified removal of telegraphists' cramp from the third schedule of the WCA. This proposal was not accepted by Post Office management because of legal repercussions but continued to shape Dr Prynne's opinion that the disease was of psychological origin. Stage 3 of the model is presented in Figure 6-1.

My findings have led me to update the empirical mapping of the Fleck model for telegraphists' cramp. I propose that the disappearance of the disease by the late 1920s, resulted in a lower profile of the disease internally and externally to the Post Office; there was a distinct shift from the single joint expert model proposed for the 1911 enquiry onwards towards a single medical / psychological expert model (see Figure 6-2).
Telegraphists' cramp remains as the disease objective at the heart of the model, but its nature and causation were disputed as a result of the increasing influence of work science, the rise of work psychology and the 1927 study of the disease. I argue that the esoteric circle of experts consisted of the work scientists and psychologists and the Post Office Chief

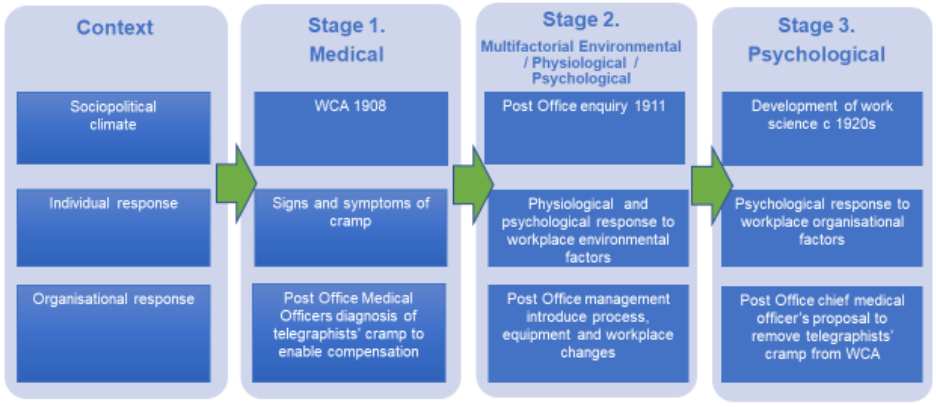

Figure 6-1 Stage 3 model for telegraphists' cramp as a musculoskeletal occupational disease.

Medical Officer (Dr Prynne) who, influenced by the study and Post Office historical data, reframed the earlier definition of the disease as a "psychoneurosis". It is possible that as he was part of the overseeing IFRB subcommittee for the work and had also analysed the previous six years of data relating to telegraphists' cramp that he extensively discussed his reframing of the disease with the study researchers. The lay members of the exoteric circle had also contracted in number during the 1920s. There was much less interest in the disease both by the trade unions and Post Office management, partly the outcomes of the telegraphists as a body being merged into larger and larger trade unions within the Post Office. The introduction of new technologies for the telegraph service and a lower incidence of new cases of telegraphists' cramp from Morse key working resulted in declining interest from the unions, apart from fighting individual cases where loss of earnings or job grade were the main issues more than the consequences of the disease.

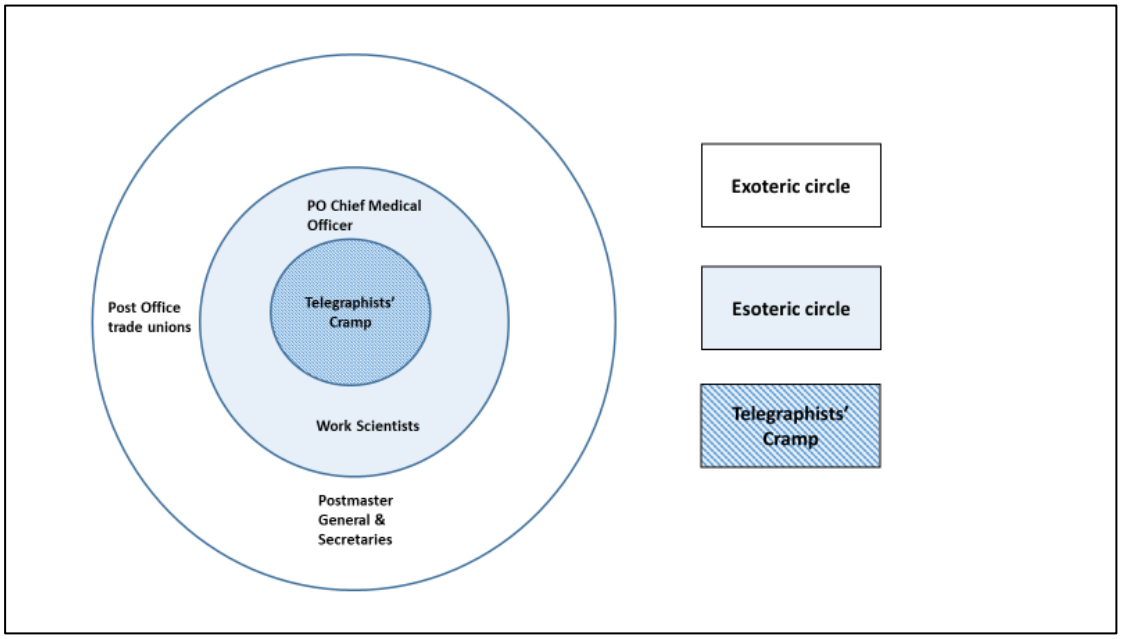

Figure 6-2 Fleckian mapping of telegraphists' cramp in 1927

However, there was one example where a spike in cases of "arm troubles" among female and junior telegraphists in the WW1 years interested the Postal and Telegraph Clerks Association (P&TCA), who demanded an enquiry (similarly to the PTCA previously in 1907 and 1910), which was rejected by Post Office management. With regard to the Postmaster General and Post Office management, the archive evidence demonstrating less frequent communications regarding telegraphists' cramp supports the theory of declining interest in, and therefore reduced visibility of the disease.

6.6 Conclusion

After WW1, work science initiatives which focused upon the interactions between workers, their work equipment, and their wider work environment developed in Britain. Two research organisations developed in the early 1920s: the government sponsored IFRB and the private

industry funded NIIP.[556] The purpose of the IFRB and NIIP research was not only to understand human-workplace interactions, but significantly, to propose solutions, recommendations and strategies that could prevent exposure to ill health and disease at work. This was a major shift from the medical model of doctors treating health outcomes resulting from exposure to toxic chemical and physical agents in the workplace. The approaches taken by the IFRB and NIIP scientists contributed to workplace ergonomics (the human factor) and established occupational psychology. However, the official recognition of ergonomics did not occur until 1949, when according to an article in *The Lancet*, the "Ergonomics Research Society" was launched.[557] The definition of this new science was:

> The study of the relationship between man and his working environment, particularly the application of anatomical, physiological and psychological knowledge of problems arising therefrom.[558]

This definition can be aligned to the objectives of the IFRB and the NIIP, whose work, whilst initially focused on fatigue and efficiency, evolved into a broader remit of an almost exclusively occupational psychology component.

The primary reasons for the disappearance of telegraphists' cramp was the modernisation of telegraphy, which occurred through the advances in communications technology. This was achieved through equipment automation and the increasing use of the telephone with less subsequent dependency on using the Morse key. From a workplace health perspective, the

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[556] Both of these were led by distinguished university academics and work projects steered by industry moderated committees.
[557] See *The Lancet,* 1950, Volume 255 (6605) pp 645-646.
[558] This society is known today as the Chartered Institute of Ergonomics and Human Factors. Its professional membership body consists of scientists, psychologists, engineers, product and process designers and occupational health and safety specialists. Whilst the present definition has evolved to include modern day industries, the same principles remain. For an introduction to present day ergonomics see https://www.ergonomics.org.uk/ for further details. Last accessed 10/05/2019.

introduction of new technology to automate telegraphy reduced the incidence of new cases of cramp. Indeed, in the present day improving work equipment and work procedures is used as part of a multifactorial approach to prevent and minimise occupational disease at work. However, I argue that in the Post Office the 1911 Enquiry Committee were attempting this at an even earlier stage than the research boards in the 1920s.The 1927 IFRB study did not acknowledge the work equipment and procedures recommendations from the 1911 committee. Their opinion and conclusions about telegraphists' cramp were wholly focused on the psychological status of the individual telegraphist. Sociopolitical factors also contributed to the disappearance of telegraphists' cramp. There was less interest and communication about cramp from the trade unions and, from the Postmaster General and his staff, resulting in much less visibility of the disease. Even though a few odd new cases emerged, discussion was largely centred on transfer to other duties within the Post Office. In the 1920s, the Post Office's main concern was the overall financial liabilities of the inland telegraph service, which was competing internally with the telephone service for business. Added to this was dealing with the long legacy of telegraphists' cramp cases from the previous twenty years. This presented organisational management issues as a result of the staff costs associated with 70% of the telegraphist' workforce being on maximum pay within their job grade, many of whom had been disabled by Morse key use much earlier and were restricted to non-manipulative duties.

The modelling of telegraphists' cramp as an occupational disease became modified in the 1920s. The conclusion that the disease was an occupational neurosis based on the psychoneurotic state of the individual led to a reframing of the disease as being one of psychological origin. The growing profile and influence of work science and the 1927 study findings prompted Dr Prynne to propose that the disease should be removed from the third schedule of the WCA. Although this was not accepted by Post Office management, I argue that Dr Prynne's proposal can still be interpreted as an organisational response, albeit from

the Post Office Medical Department. The updated Fleck model reflects the disappearance of the disease and lessening interest by the Post Office and trade unions. The esoteric group consists solely of the scientists and Dr Prynne, and the exoteric group the Post Office and the trade unions. A reduction in communications and information exchange between the exoteric and esoteric groups also supports lessening interest and visibility as a factor in the disappearance of the disease.

7 Discussion

7.1 Introduction

The principal aim of this research has been to undertake a qualitative case study of the history of telegraphists' cramp in the British Post Office. Telegraphists' cramp was an occupational disease that has attracted little attention from social historians and references in occupational health history are scarce, possibly because of its relatively short lifespan. To fulfil the research aim, I directed my research towards answering the following questions:

1. How did telegraphists' cramp emerge as an occupational disease, how was it framed as a disease entity and what were some of the medical classification issues?
2. How was telegraphists' cramp negotiated and contested as a compensatable occupational disease within the political structure in Britain between 1875 and 1930?
3. How did the framing of telegraphists' cramp change with the establishment of professional scientific bodies?
4. Can the disease be mapped as an occupational musculoskeletal disorder considering the changing medical, political and scientific definitions, and by using a Fleckian approach to map the social and sociopolitical networks involved?

I constructed the research questions to enable the creation of the history of telegraphists' cramp from its first appearance within the context of late nineteenth-century medical discourses relating to the understanding of musculoskeletal disease and against the political and industrial relations background in Britain. To establish how telegraphists' cramp could be framed as a disease entity I scrutinised current constructs of disease and illness. Telegraphists' cramp emerged when the principle of compensation for those injured by working with hazardous processes and materials was being legally established in Britain. It

was added to the schedule of compensatable diseases, and documents relating to the successive Workers' Compensation Acts and official enquiries into the disease provided a context to the processes by which this occurred. The emergence of the Industrial Fatigue Research Board (IFRB) and the National Institute of Industrial Psychology (NIIP) as bodies of professional scientists undertaking workplace science research, and their report findings, enabled me to demonstrate that the framing and definition of telegraphists' cramp changed as a result of their influence. Question 4 the final research question, builds upon the analysis of evidence and enabled creation of the two strand model of telegraphists' cramp as an occupational musculoskeletal disorder accounting for the social and sociopolitical relations and networks surrounding the disease.

7.2 Framing telegraphists' cramp as an occupational disease.

In order to advance my understanding of how telegraphists' cramp could be framed as a disease entity and create explanatory models of it, I examined theories concerning the social constructionist view of illness and disease.[559] My analysis of some of these indicated that although there is no single agreed definition or model there is strong concurrence on the social factors and nature of these that shape the influences of illness and disease on people. For example, both Brown and Rosenberg offer a staged approach with common themes, starting with identification and diagnosis by the persons affected and their interactions with medical professionals, leading to diseases outcomes (Brown), and the framing, labelling and medicalisation that result from doctor-patient interactions (Rosenberg). I argue that illness in the workplace follows a similar trajectory. Historically, workers have self-framed occupational

[559] See for example P Brown, "Naming and Framing: The Social Construction of Diagnosis and Illness"*, Journal of Health and Social Behaviour,* Volume 35, 1995; pp 34-52, L Jordanova, '"The Social Construction of Medical Knowledge", *Social History of Medicine,* Volume 7(3), 1995 pp 361-381, C Rosenberg, "Framing Disease: Illness, Society and History", in C Rosenberg and J Golden (eds*.), Framing Disease: Studies in Cultural History* (Rutgers: Rutgers University Press, 1992), pp xiii-xxvi.

disease for many years, by verbal association of conditions associated with their work tasks, leading to an establishment within work cultures of trade specific occupational diseases, for example miners' lung, miners' nystagmus, phossy jaw.[560] I propose that telegraphists' cramp was no different and that finger, hand and wrist muscular cramp and pain symptoms observed and experienced by telegraphists using the Morse key were labelled by them and doctors as telegraphists' cramp on the basis of signs and symptoms presented and occupation. The outcome of this was that at a relatively early stage in the life cycle of the disease within the Post Office, telegraphists' cramp became embedded in the culture and management hierarchies as a new disease that had not been previously encountered.

7.3 The origins of telegraphists' cramp as an occupational musculoskeletal disorder

In order to address my first research question, I examined the emergence of "occupational neuroses", a term first used by doctors at the end of the nineteenth century to categorise the effects resulting from repetitive hand and wrist movements performed in the context of work. The term was devised by the physician William Gowers who specialised in the study of the nervous system, to define "peripheral sensory" conditions of the upper limbs resulting from muscle and nerve disturbances. This definition was qualified by fatigue, hours worked and repetitive movements as being key factors in the development of occupational neuroses. Contemporaneously with this, doctors were also proposing new theories about the effects of rapid industrialisation on British society, leading to the conception of constructs of fatigue and neurasthenia as "diseases of modernity".[561] My analysis of archive materials indicates

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[560] Commonly encountered names are "potters rot", "miners lung", "wool sorters disease", "phossy jaw", "writers' cramp". For example see A McIvor*, Miners Lung: A History of Dust Disease in British Coal Mining* (Oxford: Ashgate, 2007), Bartrip, *The Dangerous Trades,* Dembe, *Occupation and Disease* (London: Yale University Press, 1996).

[561] See A Rabinbach, *The Human Motor, Energy, Fatigue and the Origins of Modernity (*Berkeley and Los

that although social historians have often viewed fatigue and neurasthenia as separate discourses, the medical practitioners of the time viewed them as linked constructs, with work and the pace of life contributing to muscle fatigue and pain symptoms.

In the late nineteenth century, doctors had considerable experience in treating writers' cramp, as evidenced by reports in *The Lancet* and *The British Medical Journal,* which reported cases histories, diagnosis and treatments prescribed.[562] The focus on writers' cramp was an indirect result of industrialisation, there were more people being employed in administrative roles in banks, insurance companies and other businesses that supported industrial growth. Gower's definition was a paradigm shift for doctors who had previously believed writers' cramp was of cerebral origin. When telegraphists' cramp first appeared it was also classified as an occupational neurosis, doctors prescribed similar treatment regimes to those adopted for writers' cramp. I propose that many of the practices and treatment regimes for writers' cramp and telegraphists' cramp originated from the approach doctors took for treating neurasthenia and fatigue, although neurasthenia was distinguished as a whole body condition rather than being confined to the upper limbs. Many of the treatments for writers' and telegraphists' cramp were personalised and gender specific, evident from the case histories presented in the medical journals. At first sight it might appear that writers' cramp and telegraphists' cramp were variants of the same condition. However, I propose that doctors treated them differently through patient reports of their occupation, work tasks and time spent working and thorough medical examination. I argue that the doctor-patient interactions are sufficient to separate them as distinct occupational diseases. Within the same time frame (late nineteenth century) there were some investigations of telegraphists' cramp from a physiological perspective. One of these, by

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Angeles: University of California Press, 1992 pp 84-88 for a discussion on modernity and pp 19-44 for a general discussion on the "discovery" of fatigue in society in the 1870s. In this thesis, see Section 2.3 for further discussion of this.

[562] This is discussed in more detail in Section 2.6 of the thesis.

Thomas Fulton in 1884, I propose to have been significantly innovative. Fulton observed telegraphists using the Morse key at work and empirically measured a range of variables: working speeds, finger hand and wrist movements, and muscle contractions. Fulton's work continued to be influential some forty years later. It was cited as evidence in both the 1910 - 1911 Department Enquiry into telegraphists' cramp and later in the 1927 Smith and Culpin study. I argue that Fulton's evidence was also a factor in the recognition that telegraphists' cramp was of multifactorial causation, which I defined and justified in Chapter 5.

In the late nineteenth century telegraphists' cramp assumed what I shall define as an early history of the disease, based on the sporadic and elusive nature of the disease as found in the social and historical context within Post Office reports. I expected to discover that following initial reports, there would be growing interest in the disease, but this is not supported by available archive evidence. Whilst the first cases of telegraphists' cramp within the Post Office, were reported by Post Office Medical Officers in *The Lancet* and *The British Medical Journal,* there was little interest, despite recognition in the wider medical profession that telegraphists' cramp was an occupational neurosis.[563] By contrast, among the telegraphist workforce within the Post Office, there was growing concern about the disease as indicated by the peer to peer correspondence in the staff telegraph journals.[564] I propose that at this point, lay medical knowledge of the condition was developing within the workforce. Many authors published used assumed identities, whether this was fear of some Post Office management backlash or whether some of this was correspondence from Post Office doctors cannot be ascertained from the archives. By the late 1890s trade unions within the Post Office were well developed.[565] Despite the vocal communications by the

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[563] For example, see the four cases reported by Edmund Robinson, "Cases of Telegraphists' Cramp", *The British Medical Journal* 1882, Volume 2 (1140) p 880.
[564] For example, see the letters written in *The Telegraphist,* MSS.148/PT/2/2/1 (December1st, 1884) and *The Telegraphist,* MSS.148/PT/2/2/1 (February 1st, 1885), Warwick: Modern Records Centre Archive.
[565] The Postal Telegraph Clerks Association (PTCA) was established in 1881 and was the first trade union recognised by the Post Office.

telegraphists within house journals the Postal Telegraph Clerks Association (PTCA), the telegraph trade union, was more interested in agitation against their employers, originally contesting wages and job grades, although health and working conditions started to emerge as part of discussions during the Tweedmouth Committee discussions.[566]

In the first decades of the twentieth century telegraphists' cramp eventually became acknowledged and accepted by the Post Office as a work related occupational musculoskeletal disorder. I argue that one of the catalysts for this was the successive Workmen's Compensation Acts (WCAs). The first WCA became law on July 1st, 1898 and at its core was the concept of no fault accidents (unless misconduct could be proved).[567] By the time of the 1906 WCA, workers who had contracted diseases at work over a prolonged time period were provided for. The legal interpretation of this was as if the diseases had been the outcome of a single accident event. This was a significant step, as it acknowledged the contraction of occupational disease in the workplace and placed responsibility on employers for the health of their workforce. Six specified work processes and diseases resulting from exposure to them were originally included as part of the 1906 Act.[568] Whilst the WCAs represent recognition of the need to compensate workers damaged by disease during their employment, this was also political and reflected the Liberal government's desire for social and workplace reform. The pursuit of compensation for telegraphists' cramp added another dimension to the whole issue of compensation for contracting an occupational disease. The concept of government civil servants working in a low risk office environment contracting work-related disease had never before been considered. Therefore, this was a

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[566] The Tweedmouth Committee was one of the enquiries into Post Office pay and conditions that functioned between 1895 and 1897.

[567] Not all workplaces were included, however - factories, railways, mines, quarries, construction and its powered machinery were included; offices, shops and other premises and occupations were exempted. See P Bartrip and S Burman *The Wounded Soldiers of Industry: Industrial Compensation Policy, 1833 -1897* (Oxford: Oxford University Press, 1983).

[568] These were added to the Third Schedule of the Workmen's Compensation Act 1906; see Chapter 1 for details. The six processes were exposure to: arsenic, mercury, lead, phosphorus, the diseases anthrax (from working with animal skins and wool) and ankylostomiasis (a parasitic hookworm found in mud and dirt in mines).

major difference between the telegraphists and workers in other industries being eligible for compensation. In Chapters 4 and 5 above, I have provided an analytical account of the government enquiry into telegraphists' cramp as a compensatable occupational disease (Chapter 4) and the internal Post Office enquiry in 1910 to 1911 which associated telegraphists' cramp to workplace environmental factors (Chapter 5). From this analysis I argue that between 1900 to 1914 was the critical time period when telegraphists' cramp achieved maximum sociopolitical exposure. After WW1, political interest in the disease declined and with the changes in the technology the disease itself eventually disappeared in the 1930s. This was primarily the result of automation within the Post Office, but the rise of psychology in the workplace was also a contributing factor, as I have discussed in Chapter 6.

7.4 A social-historical model that explains the history of telegraphists' cramp

One of my research aims (research question 4) was to generate a model of telegraphists' cramp that could be used to explain the history of the disease during its lifecycle. In fact, my research resulted in the creation of a two stranded model. During the timeline of the disease, I argue that the framing and definition of telegraphists' cramp altered in response to changing medical, political and scientific arguments and this is reflected in the first strand of the model, that which maps the disease in three stages to account for the sociopolitical climate and, individual and organisational responses to the disease. I argue that this extends Brown's approach in defining the stages in the social construction of an illness to account for occupational disease.[569] Whilst this will accommodate the changing interpretation of the disease, I also wanted to more precisely define the communications between the social networks and sociopolitical relationships involved. The three stages of the mapping model

[569] Brown defines four stages of the social construction of an illness. See P Brown, "Naming and Framing: The Social Construction of Diagnosis and Illness", *Journal of Health and Social Behaviour,* Volume 35, 1995; pp 34-52.

represent how the definition of telegraphists' cramp evolved over time in response to increased knowledge and altered medical and scientific theories and perspectives of it. The changed definition is also linked to the sociopolitical climate and specific events during the life cycle of the disease. The specific events were the WCA and Industrial Diseases Committee (Stage 1), the Post Office Enquiry of 1911 (Stage 2) and the development of work science in the 1920s (Stage 3). These events modified beliefs about individual responses to disease and also how the Post Office changed its organisational response to reflect the changing sociopolitical, medical and scientific definition and opinion. Each stage of the model will be examined in turn (see Figure 7-1, Figure 7-2, and Figure 7-3).

Stage 1 of the disease (Figure 7-1) coincides with a drive by the Liberal government's agenda for social and work place reform at the beginning of the twentieth century, manifested by successive WCAs and the Industrial Diseases Committees' investigation into individual occupational diseases. Contemporaneously, within the Post Office, telegraphists' cramp was emerging and being proposed by the PTCA as a disease that should fall within the scope of the WCA. Against this sociopolitical background, Dr Sinclair was collecting empirical data on the prevalence of telegraphists' cramp in the workforce defined by the signs and symptoms reported to him by individual telegraphists. These two events (the separate government and Post Office activities) converged when the Post Office evidence was heard by the Industrial Diseases Committee.

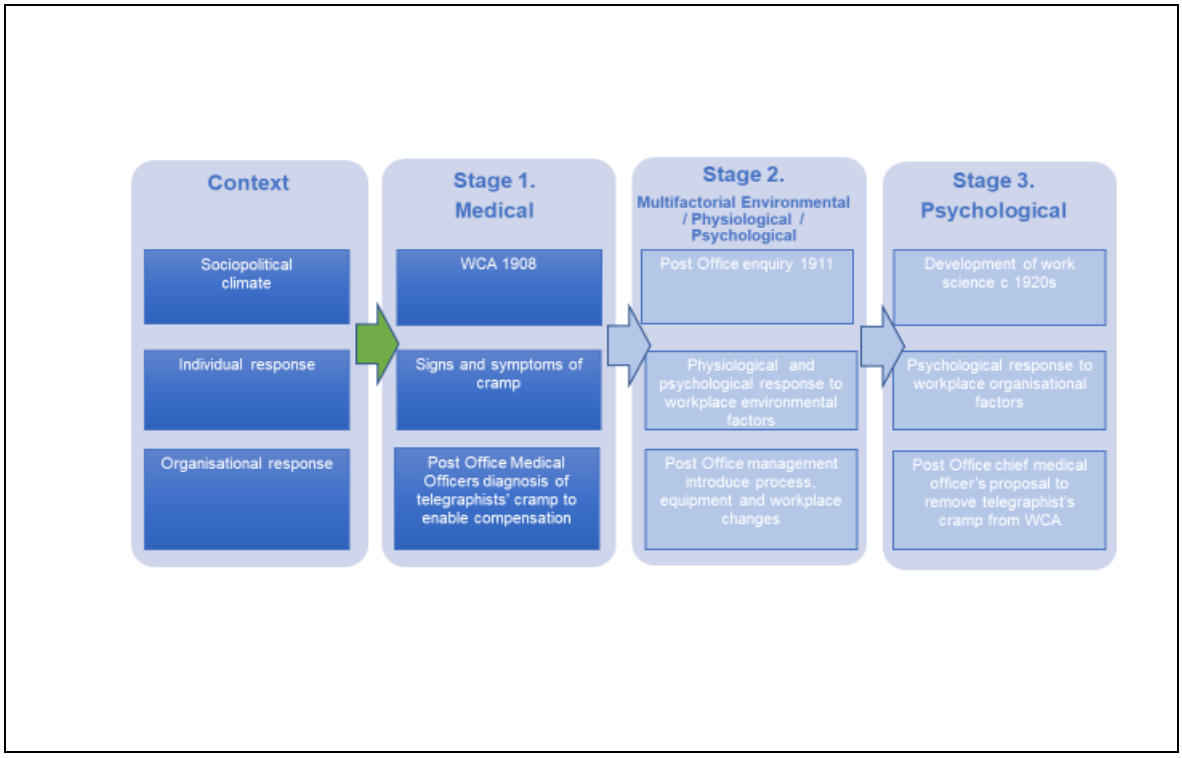

Figure 7-1 Stage 1 model for telegraphists' cramp as a musculoskeletal occupational disease.

The outcome of this was that telegraphists' cramp was added to the legislation as a compensatable disease associated with using the Morse key for telegraphy. I propose that the sociopolitical climate was therefore singly focused on the compensation question and the individual response was viewed purely in terms of telegraphists' reporting signs and symptoms, even though the PTCA and Dr Sinclair both recognised elements of the workplace system as contributory ergonomic factors to the development of the disease. The Post Office response to the scheduling of telegraphists' cramp was to delegate all compensation-related matters to Post Office Medical Officers, evidence that despite disputing whether telegraphists' cramp was a discrete disease entity, they interpreted it as a medical phenomenon falling within the remit of their doctors.

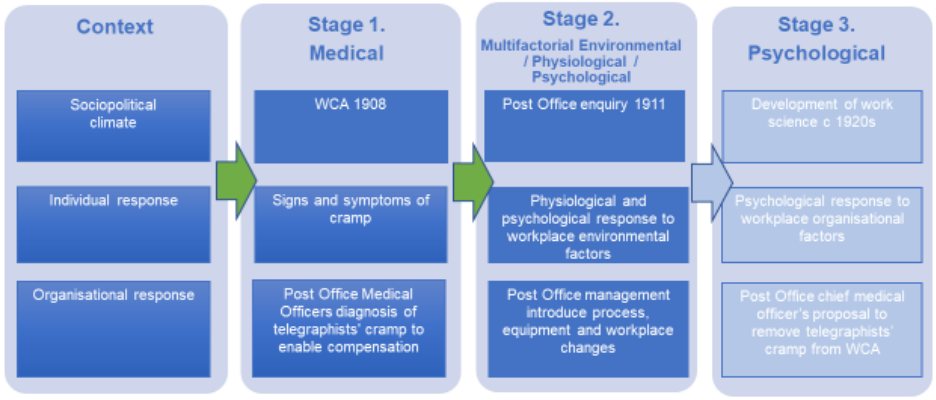

Figure 7-2 Stage 2 model for telegraphists' cramp as a musculoskeletal occupational disease.

The 1911 Post Office department enquiry is the event that defines Stage 2 of the model (Figure 7-2). As a result of the evidence examined for this enquiry which came from varied sources (see Chapter 5), the medical definition of the disease changed to encompass the concepts of what I have defined as multifactorial causation and multifactorial workplace environmental factors. The result of this was that the individual response to the disease underwent a major contextual transformation where telegraphists' cramp was thought of in terms of the physiological and psychological responses of individuals to multifactorial work environmental factors, rather than just purely the medical signs and symptoms of the disease. This was a paradigm shift for the Post Office as it represented the development of understanding of work-related musculoskeletal disease in the context of workplace ergonomic factors. Although the enquiry recommendations focused on required physical changes such as alternative telegraph equipment, workstation space and suitable chairs, psychological factors such as work rates and work pressure were also prominent within the

discussions. At this stage in the history of telegraphists' cramp, I propose that the accepted view of the disease evolved from a medical interpretation stage (stage 1) to one modified by the effects of identified multifactorial environmental factors (stage 2). The Post Office organisational response to this was to introduce procedural and work environmental changes.

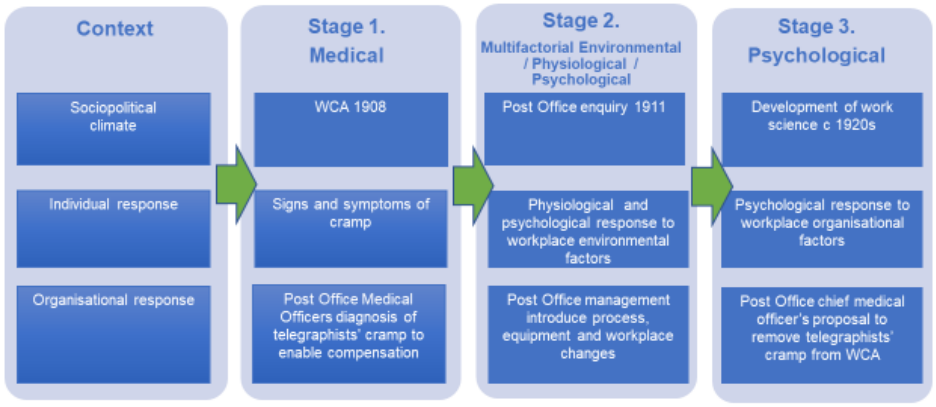

Figure 7-3 Stage 3 model for telegraphists' cramp as a musculoskeletal occupational disease.

Following the experiences of WW1 and the Health of Munitions Workers Committee (HMWC), investigation and prevention of ill health at work remained on the government's agenda. The creation of the IFRB and the NIIP enabled this, with the development of workplace science, tools and techniques to undertake investigative research although this was against an overall background of government resistance to introduce further regulation to improve workplace standards. For example, the NIIP was privately funded by prosperous

and newly developing industries such as paints and plastic manufacture, therefore the impact of their work had little effect on the older heavy industries such as mining and shipbuilding. Nevertheless, the work of the IFRB and NIIP did gain a high profile amongst some industrial and medical communities (especially medical journals such as *The Lancet* and *The British Medical Journal*), which in turn filtered down to the Post Office. The IFRB study of telegraphists' cramp, published in 1927, concluded that the disease was an occupational neurosis, but one that was based on the 'psychoneurotic state of the individual telegraphist'.[570] This proposal further changed the context of the disease from that of a physiological and psychological-workplace environmental entity with the potential to affect the whole telegraphist population to one that focused heavily on the psychological status of the individual i.e. stage 3 (Figure 7-3). This was set against the background of the sociopolitical climate of work science and the interest in workplace psychology. The organisational response to this by the Post Office was primarily by Dr Prynne, who proposed that the scientific evidence from the study findings justified removal of telegraphists' cramp from the third schedule of the WCA [571]. This proposal was not accepted by Post Office management because of legal repercussions but continued to shape Dr Prynne's opinion that the disease was of psychological origin.

In conclusion, creating the three-stage model presented above, has enabled me to identify the key points in the history of telegraphists' cramp within the context of the main historical influencing events and the outcomes from these. The stages in the model represent the evolution and framing of telegraphists' cramp from first being observed and classified as an individual medical phenomenon, then as a physiological and psychological response to work environmental factors, and finally as a wholly psychological response to work organisational factors. This provides what I argue is a human centred approach to thinking about the

[570] See M Smith, M Culpin and E Farmer, "A Study of Telegraphists' Cramp", *Industrial Fatigue Research Board,* Report 43, 1927, pp IV-48. (London: His Majesty's Stationery Office, 1927).
[571] Dr Prynne was the Chief Medical Officer who took over when Dr Sinclair retired in 1923.

disease, that is the individual response is at the heart of the model, situated in and influenced by a wider context of government sociopolitical initiatives such as legislation, medical and scientific knowledge theories and practices, and employer and organisational actions in response to changes. The three stages of the model are therefore linked by telegraphists' cramp as the disease entity, the progression of time and the sequential sociopolitical events which influenced the individual response by the telegraphists and their employers, the Post Office.

I have based a second strand of the model based on the work of Ludwick Fleck and his concepts of communities of thought collectives and their structural composition of esoteric groups ('specialised' and 'generalised' experts) and exoteric groups (lay persons).[572] I propose that Fleck's model can be used to explain the different groups of experts and lay persons and how they interacted throughout the duration of telegraphists' cramp. However, I have extended Fleck's model to provide an account of the changed dynamics and social interactions between the experts and lay person groups that occurred over the lifecycle of the disease. I have represented these as three separate evolutions of the models which relate to the mapping model as they directly identify with the key events identified in the historical timeline of telegraphists' cramp. Thus, these evolutions document the WCA and Industrial Diseases Committee, the Post Office Enquiry of 1911, and the development of work science in the 1920s (presented in Figure 7-4, Figure 7-5, and Figure 7-6).

I argue that thought collectives and thought styles first emerged during the route to compensation for the telegraphists (see Figure 7-4). Broad thought collectives concerning telegraphists' cramp reflect the groups of actors involved: the telegraphists and PTCA, Post Office Management and the Postmaster General, and the medical professionals. The Industrial Diseases Committee can also be considered as a discrete thought collective. I

[572] See Chapter 1 of the thesis for my analysis of Fleck's theories.

suggest these can be thought of as separate identities, hence their representation as three intersecting circles. The three esoteric groups held differing views of telegraphists' cramp as the disease object, which in turn shaped the knowledge and experience of the disease to create the thought style. The archives provide evidence that there was reinforcement of opinion within the groups, leading to different opinions on causation and work relatedness. For example, the PTCA perspective was that the disease was work related and therefore should attract compensation; the medical professionals focused on the origin and epidemiology of the disease, the cerebral or peripheral physiological nature with no specific views voiced about compensation; and the Industrial Diseases Committee approached telegraphists' cramp with experience of other occupational diseases and a brief to recommend compensation if they deemed it necessary.

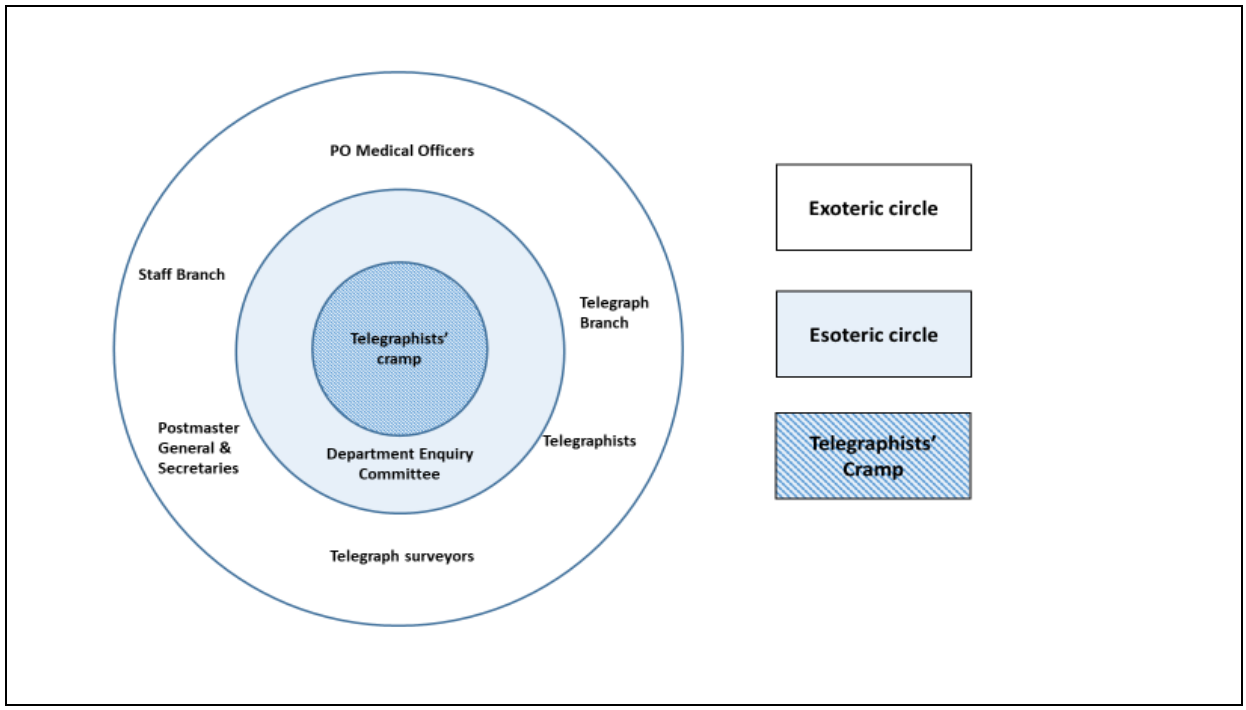

Figure 7-4 Fleckian mapping of telegraphists' cramp in 1908

I propose from my analysis that by 1911, the Fleckian model had changed from that of 1908 (see Figure 7-5). The experts (the esoteric circle) can be visualised as the single group

which formed the Department Enquiry Committee. Whilst the constitution of the committee still included the PTCA, and doctors, it expanded to include Post Office management and telegraph engineering representatives. I argue that the committee functioned as a single expert body but although there was a division of labour to fulfil the enquiry tasks, in order to meet the goals of establishing prevalence and means of prevention of telegraphists' cramp, there had to be group consensus on conclusions reached. The exoteric circle also increased in size both during and after the enquiry, as a direct effect of the remit and duration of the committee with its inclusive working methodology.[573] I suggest that the lay members of the exoteric circle could no longer ignore the presence and nature of the disease; the enquiry output was a detailed and clear final report with several appendices and was available within the public domain through Parliament, *The Lancet* and *The Telegraph Chronicle*. In my opinion, this would make it impossible for the Post Office management staff to deny, reinterpret or misunderstand the evidence and conclusions presented to the Postmaster General.

[573] This resulted in more opportunities for consultation and communication within and between the lay groups of staff within the Post Office, especially when compared to the 1908 committee which heard evidence only from the PTCA and Dr Sinclair. The 1908 committee had a much wider remit and examined many industries, and therefore had limited time available to evaluate telegraphists' cramp.

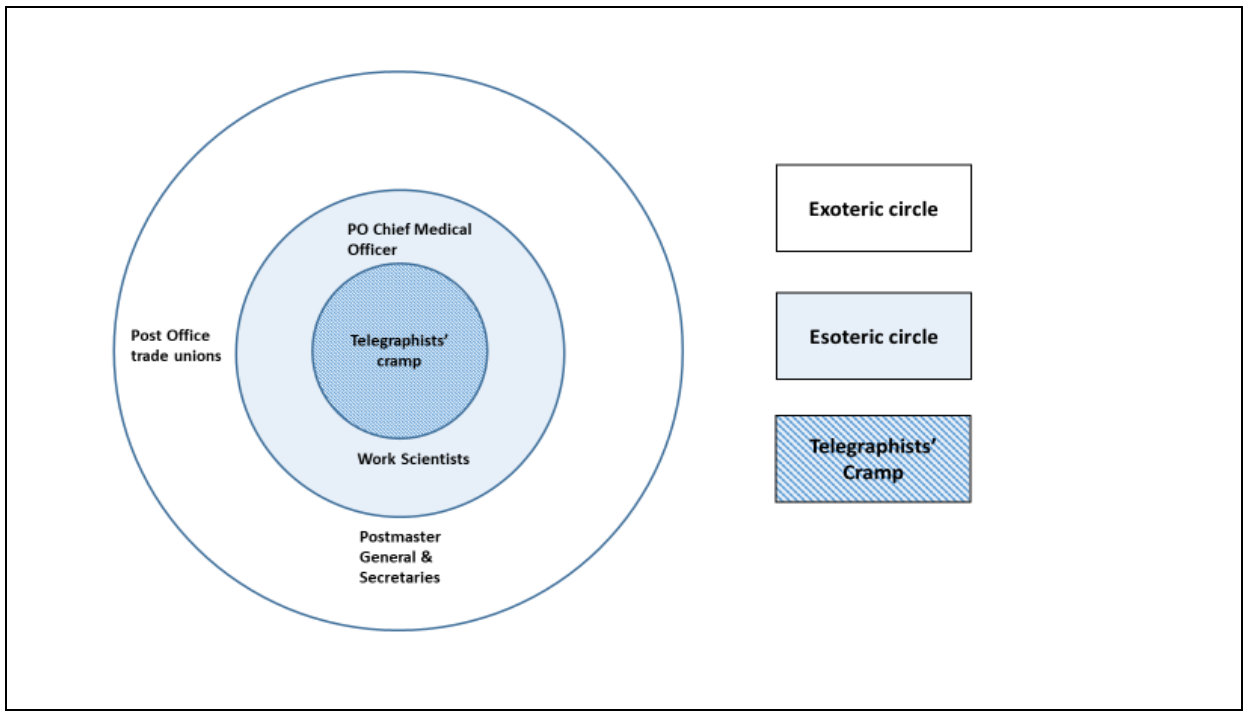

Figure 7-5 Fleckian mapping of telegraphists' cramp in 1911.

By the 1920s, loss of interest in the disease by the trade unions and the Post Office and the declining incidence of the disease resulted in a lower profile of the disease internally and externally to the Post Office; there was a distinct shift from the single joint expert model proposed for the 1911 enquiry towards a single medical / psychological expert model (see Figure 7-6). Telegraphists' cramp remains as the disease object at the heart of the model, but its nature and causation were disputed as a result of the increasing influence of work science, the rise of work psychology and the 1927 study of the disease. I argue that the esoteric circle of experts consisted of the work scientists and psychologists and Dr Prynne, the Post Office Chief Medical Officer who, influenced by the study and Post Office historical data, reframed the earlier definition of the disease as a "psychoneurosis". I suggest that he may have extensively discussed his reframing of the disease with the study researchers, as he was part of the overseeing IFRB subcommittee for the work and had also analysed the previous six years of medical data relating to telegraphists' cramp.

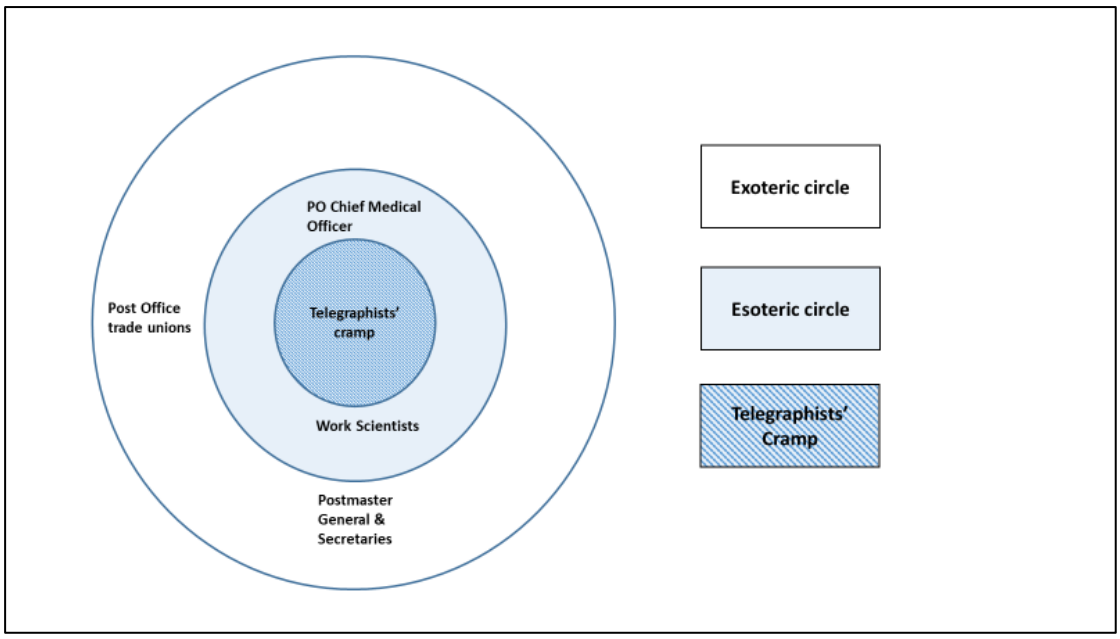

Figure 7-6 Fleckian mapping of telegraphists' cramp in 1927

There was much less interest in the disease both by the trade unions and Post Office management in the 1920s, partly as an outcome of telegraphists as a body being merged into larger and larger trade unions within the Post Office, so the lay members of the exoteric circle contracted in number during the 1920s. The introduction of new technologies for the telegraph service and a lower incidence of new cases of telegraphists' cramp from Morse key working resulted in declining interest from the unions, apart from fighting individual cases where loss of earnings or job grade were the main issues more than the consequences of the disease. By this stage, the Postmaster General and Post Office management as evidenced by less communication in the archives, showed a declining interest in telegraphists' cramp, contributing to the loss of visibility of the disease.

As with the first strand of the mapping models, the Fleck models I have created explain the different groups of experts and lay persons involved and how they interacted during the life cycle of telegraphists' cramp. The three stages represent how the collectives emerged and evolved as dynamic changing social networks, influenced by the three key historical events

and responding to changing medical, political and scientific arguments.[574] However, I would also argue that the collectives reflect the different levels of social interest, consolidation of knowledge sources and powers of decision making concerning telegraphists' cramp. In 1908, the evidence presented to the Industrial Diseases Committee came from three separate origins: the observations by the PTCA, the empirical evidence collected by Dr Sinclair, and the broader knowledge of the Industrial Diseases Committee gained by their experience of hearing evidence provided by a range of occupations from which they solely made the decisions about compensation. By 1911, although the evidence streams of knowledge presented to the Enquiry Committee originated from different sources and committee members, the Committee acted as a single joint expert body to process the acquired knowledge and provide a consensus on their findings. In the 1920s, the Fleck model changed again and moved away from the collective decision making in 1911 by reverting to a single expert model (the IFRB researchers and Dr Prynne) who focused on medical and psychological knowledge to reach the decision to reframe the disease as a "psychoneurosis". By this stage as the technology was advancing and automation increasing removing the need for Morse key use declined, the disease disappeared also as a result of less interest by the Post Office and telegraphist trade unions.

The Fleckian approach has been applied more recently to a study of the group of upper limb musculoskeletal disorders known as Repetitive Strain Injury (RSI), in order to attempt a social construction of RSI in the UK in the 1990s.[575] Although this applied Fleck's two prime analytical concepts of thought collectives and thought styles to the RSI study, the author (Arksey) suggested renaming collectives as "collectivities" as a means of capturing interaction within and between groups of orthopaedic surgeons, rheumatologists, GPs and

[574] The three main events were: the 1908 Industrial Diseases Committees' hearing and recommendation that telegraphists' cramp should be subject to the WCA. The 1911 enquiry and its outcomes, and the 1927 IFRB study of telegraphists' cramp.

[575] H Arksey, "Expert and Lay Participation in the Construction of Medical Knowledge", *Sociology of health and illness,* Volume 16(4), 1994; pp 448-468.

RSI sufferers, and did not distinguish between exoteric and esoteric groups although defined "hybrid collectivities" as a term to capture the consensus between two or more of the groups. [576] Arksey used the model only to locate the compensation claims process "in a network of social and cultural influences" but did not examine the medical or workplace perspective or investigate how the model might have evolved with time.

[576] H Arksey, *RSI and the Experts, the Construction of Medical Knowledge (*London: UCL Press, 1998), pp164-165.

7.5 Conclusion

I would argue that the telegraphists' cramp case study and the creation of the mapping models contributes significantly to the body of historical knowledge of occupational musculoskeletal disorders at the start of the twentieth century. I also propose that the mapping models provide a methodology that historians of occupational health could use when investigating historical and present day occupational diseases especially where there is evidence to suggest multifactorial causation. The mapping models provide a methodology that synthesizes all the sociopolitical factors to account for workers, management, and medical and scientific experts involved during the timeframe of a disease, so would also be a useful addition that historians of occupational health could use in future investigations of occupational disease.

Whilst there is an existing scientific literature and models generated to support current theory of causation and risk factors for occupational musculoskeletal disorders, to the best of my knowledge there is no literature to document the recent history of these diseases which examines the medical, political and scientific perspectives and the social networks involved. In the present day musculoskeletal disorders continue to proliferate in office environments with the implementation of new technologies. The introduction of new and mobile technologies and different working styles relying on devices such as tablets, laptops and mobiles used outside a traditional office desk and chair environment is one example of this. Musculoskeletal ill health and disabling disease still account for large numbers of lost working days. In 2017 to 2018, the UK Health and Safety Executive (HSE) reported a total of 469,000 workers self-reporting musculoskeletal disorders, and of these 197,000 (42%) were in the upper limbs or neck, with a total of 2.6 million lost working days. Repetitive keyboard

work is cited as one of the prime causative factors for the upper limbs along with manual handling, lifting and carrying for the lower limbs.[577]

Similarly to the way in which telegraphist's cramp developed following the introduction of new office technology in the early twentieth century, when computer technology was introduced into business environments on a large scale in the 1980s, occupational musculoskeletal disorders of the upper limbs occurred in westernised workplaces, with media reports and accounts of "RSI epidemics".[578] In the years following when affected workers sought personal injury compensation (civil) claims for injuries sustained at work, the ensuing court cases attracted a high level of media publicity. In the early cases, RSI was associated with keyboard use, with some high profile companies successfully sued for damages including British Telecommunications.[579] Medical and legal opinion was polarised between those who believed that RSI was a "real disease" and those who did not, which was extensively reported by the media.[580] I argue that this replicated the discussions between the telegraphists and Post Office Management almost a century earlier. The major difference is that telegraphists diagnosed with cramp qualified for compensation because the disease was scheduled at a relatively early time point in the history of the disease, whereas the 1980s office workers had to pursue civil compensation claims against their employers, often on an individual basis.

In response to the rising number of occupational musculoskeletal disorders in the late twentieth century there have been many research studies undertaken by scientists and

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[577] See the UK Health and Safety Executive (HSE) report "Work Related Musculoskeletal Disorder Statistics (WRMSDs) in Great Britain, 2018". See http://www.hse.gov.uk/statistics/causdis/msd.pdf, last accessed 10/05/2019.

[578] See the short account of the Australian "RSI epidemic" in S Pheasant, *Ergonomics Work and Health* (Basingstoke: Macmillan Press, 1991), pp 79-80.

[579] The now privatised telecommunications of the Post Office, currently known as "BT".

[580] For a summary account of this see HSE Research Report 010 "How the Courts are Interpreting HSE Guidance and Health and Safety regulations – An Exploratory Study of Court Judgements in Personal Injury Claims for WRULDs" (Norwich: HMSO, 2002), pp 1-30.

ergonomists to investigate these diseases. These have focused on establishing causation, prevalence and epidemiology and identifiable risk factors.[581] In addition to this a range of conceptual models have been proposed. One model examines the internal physiological responses to external risk factors and their dependencies exposure, dose, and individual capacity.[582] Another model approaches musculoskeletal disorders in office work from a psychological perspective to account for the interactions between cognitive, biomechanical and psychosocial stress factors of computer based tasks.[583]

In 2001, a further model concisely defined the risk factors in terms of individual-workplace relationships (see Figure 7-7).[584] The commonality between these contemporary models is that they all recognise the multifactorial interaction between workplaces and the workforce exposed to a range of risks, but the individual remains at the very core of the model.

[581] For a summary account of this, see I Kuorinka and L Forcier (eds) *Work Related Musculoskeletal Disorders: A Reference Book for Prevention* (London, Taylor and Francis, 1995).
[582] See TJ Armstrong, P Buckle, LJ Fine, M Hagberg, B Jonsson, A Kilbom, IA Kuorinka, BA Silverstein, G Sjogaard, ER Viikari-Juntura, "A Conceptual Model for Work-Related Neck and Upper-Limb Musculoskeletal Disorders", *Scandinavian Journal of Work, Environment and Health,* 19(2), 1993 pp73-84.
[583] See S Sauter and N Swanson, An Ecological Model of Musculoskeletal Disorders of Office Work in SD Moon and SL Sauter A (eds*) Beyond Biomechanics Psychosocial Aspects of Musculoskeletal Disorders in Office Work.* (London: Taylor and Francis, 1996), pp 3-22.
[584] National Research Council and Institute of Medicine, Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities. Panel on Musculoskeletal Disorders and the Workplace, Commission on Behavioral and Social Sciences and Education. (Washington DC: National Academy Press, 2001) p3.

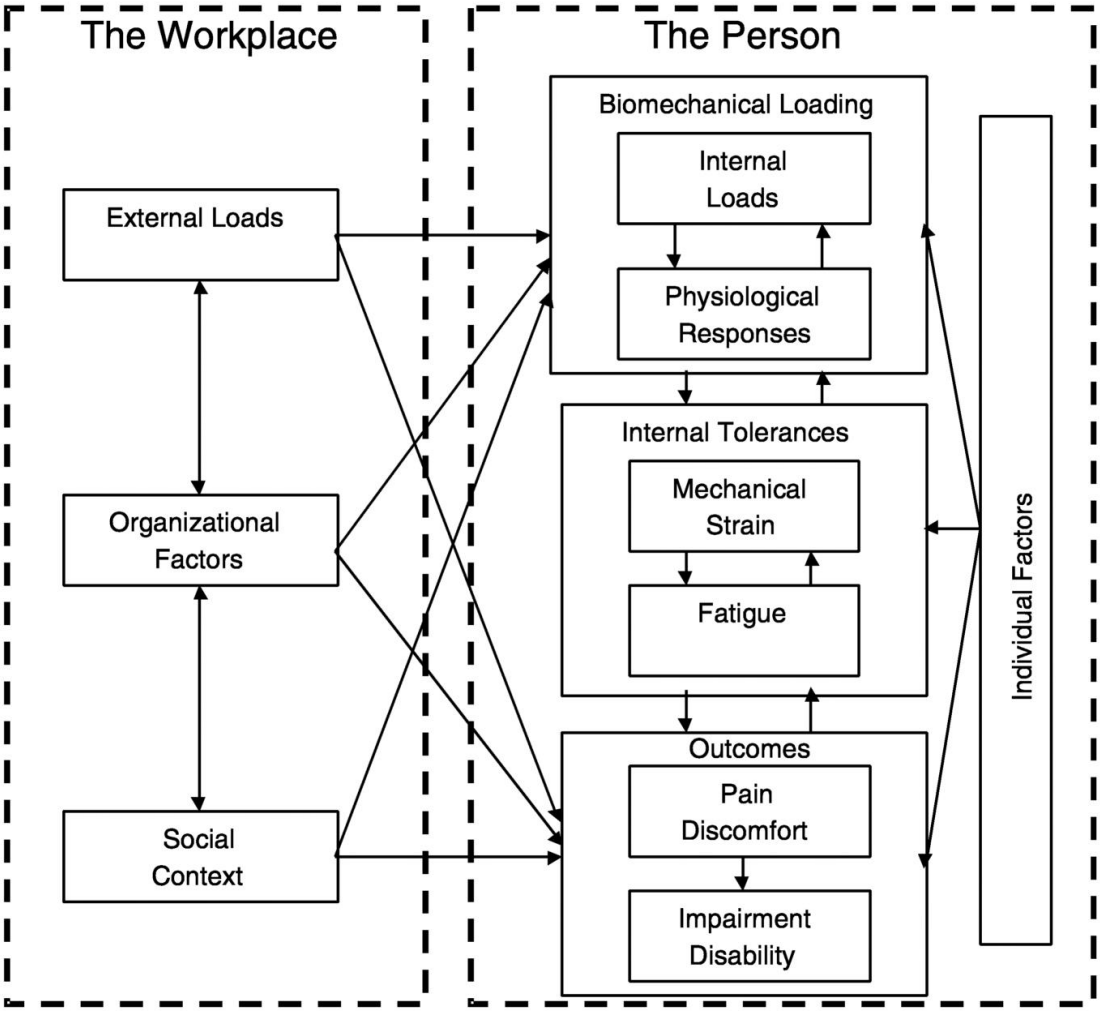

Figure 7-7 Conceptual model for occupational musculoskeletal disease risk factors developed in 2001.

When the present day models for occupational musculoskeletal disorders are compared to the two strand social-historical model I have developed for telegraphists' cramp, there are many similarities. The framing and definition of telegraphists' cramp evolved over the lifecycle of the disease from the workforce and expert professionals such as doctors and work scientists, who provided different scientific and medical interpretations and empirical data and information retrieved from work environments. The process for identification of occupational musculoskeletal disorders today is similar. A worker with symptoms may present to a doctor (most usually their General Practitioner) or an occupational health

professional in their workplace. This consultation may be followed up by an ergonomic evaluation of their workplace and recommendations for change. The major difference between today and the time of the telegraphists is that in the present day there is an established body of scientific, medical, and ergonomic evidence and guidance concerning occupational musculoskeletal disorders freely available to enable individuals and organisations to have some individual control over changes and adjustments to their workplaces.[585] I argue that today's approach is strongly focused on taking individual factors into consideration and that this is a similar construct to the Stage 3 psychological model that I have created for telegraphists' cramp, which was based on the IFRB opinion that the disease was of individual psychoneurotic origin. I propose that it is reasonable to use the present day models to support the validity of my social-historical model. The framing of telegraphists' cramp changed over the lifecycle of the disease with different medical / scientific interpretations which are reflected in my model. The history of how the present day models have evolved has not been documented, but research into their formulation may reveal a similar timeline over the lifecycle of the disease as physiological and ergonomics knowledge advances. There is one major difference between telegraphists' cramp and present day occupational musculoskeletal diseases and the models that represent them. I argue that telegraphists' cramp was a time-limited condition that disappeared with technological advancement and the endpoint of the disease incidence occurred in the early 1930s not long after the IFRB definition of the disease as an individual psychoneurosis. By contrast I would argue that although the present day models represent a similar individual approach, they also take into account external environmental factors and, despite current knowledge, the prevalence of occupational musculoskeletal diseases in the present day shows no signs of decreasing.

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[585] One example of this is recent guidance on mobile working. See E Milnes and S Tapley, "Mobile Working Risk Management System". See https://www.ergonomics.org.uk/Public/Resources/Publications/Mobile_Working.aspx, last accessed 10/05/2019.

8 Sources

PRIMARY SOURCES

Archival Materials

British Telecom Archives, London – hardcopy and digital files

POST 30/3399 File I (June 1907) to File X (February1909), *Telegraphists' Cramp*

POST 30/3400 File XI (March 1909) to File XXVII (April 1912), *Telegraphists' Cramp*

POST 30/3401 File XXVIII (March 1912) to File XLV (March 1914), *Telegraphists' Cramp*

POST 30/3402 File XLVI (March 1914) to File LXXXI (June 1935), *Telegraphists' Cramp*

POST 30/3337C File I (1911) to File XI (January 1923), *Telegraph learners and telegraph trials*

POST 30/3162B File I (January1914) to File IV (July 1928), *Telegraphists' Cramp and Medical Referees*

Royal Mail Archive (now the Postal Museum), London

POST 65/1(November to December 1866), *Proposed rules for Telegraph Clerks and Messengers Associations*

POST 64/7(December 1880), *General Instructions issued to Medical Officers*

POST 64/23 (May 1894), *Probation and Medical examinations*

POST 122/12606 (May 1920 to Nov 1921), *Post Office Medical Officers: British Medical Association*

POST 64/16 (1893-1901), *Chief Medical Officer's Annual Reports*

POST 64/17 (1901-1913), *Chief Medical Officer's Annual Reports*

Post Office Establishment Books, (1907 and 1908)

Modern Records Centre, University of Warwick, Coventry

MSS.148/PT/2/1/1 (March 1881), *Positions and prospects of telegraph clerks*

MSS.148/PT/2/1/1 (1888), *Rules of the Postal Telegraph Clerks Association*

MSS.148/PT/2/1/1 (1893), *Civil rights of the Postal Telegraph Clerks Association*

MSS.148/PT/2/1/1 (1896), *The Postal Telegraph Clerks Association: Parliamentary Guide and Missionary Handbook*

MSS.148/PT/2/2/1 (1883 to 1888), *The Telegraphist*

MSS.148/PT/2/3/1 (1889 to 1891), *The Telegraph Journal*

MSS.148/PT/2/3/2 (1891 to 1893), *The Telegraph Journal*

MSS.148/PT/2/4/3 (1895), *The Telegraph Chronicle*

MSS.148/PT/2/4/4 (1896 to 1897) *The Telegraph Chronicle*

MSS.148/PT/2/4/7 (1899 to 1900), *The Telegraph Chronicle*

MSS.148/PT/2/1/3 (1908), *The Telegraph Chronicle*

MSS.135/EU/5/10/27 (1908), *The Telegraph Chronicle*

MSS.135/EU/5/10/28 (1908), *The Telegraph Chronicle*

MSS.135/EU/5/10/30 (1911), *The Telegraph Chronicle*

Archive Websites

BT Digital archive, http://www.digitalarchives.bt.com/CalmView/Default.aspx, last accessed 10/05/2019.

Postal Museum; https://www.postalmuseum.org/discover/collections/archive-collection ,last accessed 10/05/19.

University of Warwick Modern Records Centre; https://warwick.ac.uk/services/library/mrc , last accessed 10/05/2019.

Books

Arlidge, JT., *The Hygiene, Diseases and Mortality of Occupations*, (London: Percival and Son, 1892).

Gowers, WR., *A Manual of Diseases of the Nervous System Volume 1* (London: J & A Churchill, 1886).

Gowers, W., *A Manual of Diseases of the Nervous System Volume 2* (London: J & A Churchill, 1888).

Monell, SH., *The Cure of Writers' Cramp and the Arm Troubles of Telegraphers and Ball Players* (NewYork: JB Taltavall, 1898).

Oliver, T., *Diseases of Occupation from the Legislative, Social and Medical points of view.* (London: Methuen and Co, 1902).

Pearson, K., *Tuberculosis, Heredity and Environment* (London: Dulau and Co, 1912).

Journals

I have examined many relevant articles from medical and other journals spanning the time period between 1850 and 1930. I have listed those with individual authors separately in the "Articles" sections below. Editorial or meeting reports, unless specifically authored are fully referenced in relevant footnotes. Journals consulted are:

The British Medical Journal

The Lancet

Journal of Applied Psychology

Nature

Articles

Alderson, A., “Post Office Medical Appointments” *British Medical Journal*, 1903, Volume 1 (2211) p 1183.

Bell, J.H., Cocking, W.T., Court, J., Bendelack-Hewetson, H., Snell, S., Tatum Thompson, J., and Smith, P., “A Discussion on Miners’ Nystagmus”, The British Medical Journal, 1892, Volume 2 (1659) pp 834-840.

Benthall, A., “The Workmen’s Compensation Act, 1897”, *The Lancet*, 1899, Volume 154 (3970) pp 903-904.

Benthall, A., “The Workmen’s Compensation Act, 1897”, *The Lancet*, 1899, Volume 154 (3972) p1040.

Benthall, A., “The Workmen’s Compensation Act, 1897”, *The Lancet*, 1899, Volume 154 (3982) p1773.

Bianchi, L., “A Contribution on the Treatment of the Professional Dyscinesiæ”, *The British Medical Journal*, 1878, Volume 1 (890) pp 87-89.

Culpin, M., “The Psychological Aspects of the Effort Syndrome”, *The Lancet*, 1920, Volume 196, (5056) pp 184-186.

Culpin, M., ‘Incidence of the Minor Psychoses’, *The British Medical Journal,*1927 Volume 2 (3494) p 1186.

Culpin, M., “The Conception of Nervous Disorder”, *The Lancet*, 1930, Volume 216, (5310) pp 1383 -1387.

Farmer, E., ‘Time and Motion Study’, *Journal of Industrial Hygiene*, 4, 1922 p5.

Farmer, E., Muscio, B., ‘Three Studies in Vocational Selection’, *IFRB report* no.16.

Fulton, T.W., ‘Telegraphists’ Cramp’, *The Edinburgh Clinical and Pathological Journal,* 1884; Volume 1 (17) pp 369-375.

Gilbart-Smith, T., “A Brief Outline of Dr Zander’s Mechanico-Therapeutical Institution in Stockholm”, *The Lancet,* 1881, Volume 117 (3013) pp 860-862.

Gowers, W.R., “Notes on the Functions of the Nervous System”. *The Lancet,* 1886, Volume 127 (3277) pp 1153-1154.

Gowers, W.R., “Notes on the Functions of the Nervous System”. *The Lancet,* 1890, Volume 135 (3479) pp 955-956.

Gowers, W.R., “Notes on the Functions of the Nervous System” *The Lancet,* 1890, Volume 135 (3480) pp 1006-1007.

Hamilton, J., “Post Office Medical Appointments” *The British Medical Journal*, 1903, Volume 1 (2207) p 943.

Hughes Bennett, A., “The Principles of Electro-Therapeutics” The *British Medical Journal,* 1884, Volume 2 (1247) p1006.

Jeaffreson, C.S., “Abstract of a Clinical Lecture on Miners’ Nystagmus,” *The British Medical Journal*, 1887, Volume 2 (1385) pp 109-111.

Johnson, G., “Lectures on some Nervous disorders that result from Overwork and Mental Anxiety”, *The Lancet*, 1875, Volume106 (2707) pp 85-87.

Kingston-Fowler, J., “The Treatment of Writers’ Cramp”, *The British Medical Journal*, 1882, Volume 2 (1139) pp 839-840.

Knight, A., “The successful treatment of Writers’ Cramp”, *The British Medical Journal*, 1887, Volume 2 (1400) p939.

Lockhart Clarke, J., “On the Functions of the Corpora Dentata Cerebelli”, *The Lancet,* 1858, Volume 72 (1828) pp 288-289.

MacCabe, F., “On Mental Strain and Overwork”, *The British Journal of Psychiatry*, 1875, Volume 21, pp 388-402.

Mackenzie, S., “The Powers of Natural Resistance or The Personal Factor in Diseases of Microbic Origin”, *The Lancet,* 1902, Volume 159 (4109) pp 1513-1517.

Matthews Duncan, J., “Clinical Lecture on Hysteria, Neurasthenia and Anorexia Nervosa”, *The Lancet*, 1889, Volume 133 (3429) pp 973-974.

Miles, G.H., ‘The National Institute of Industrial Psychology’ *The Australasian Journal of Psychology and Philosophy, Volume* III (4) 1925, pp 235-240.

Morton, W.J., “A Brief Glance at Electricity in Medicine”, *American Institute of Electrical Engineers, 1893; 555-623,* retrieved from http://ieeexplore.ieee.org/Xplore/home.jsp, last accessed 10/05/2019.

Playfair, W.S., “On the Limitations of the so-called “Weir-Mitchell treatment”, *The Lancet,* 1888, Volume 131 (3358) pp 88-89.

Poore, G.V., “On Fatigue”, *The Lancet*, 1875, Volume106 (2709) pp163-164.

Poore, G.V., “An Analysis of Seventy Five Cases of Writers’ Cramp and Impaired Writing Power*”, Medico-Chirurgical Transactions,* 1878, Volume 61 pp 116-146.

Poore, G.V., “Nervous Affections of the Hand”, *The Lancet,* 1881, Volume 118 (3027) pp 405-407 and *The Lancet,* 1881, Volume 118 (3029) pp 493-496.

Poore, G.V., “An Analysis of Ninety Three Cases of Writers’ Cramp and Impaired Writing Power*”, Medico-Chirurgical Transactions,* 1887, Volume 70 pp 301-333.

Prince, M., “A New Apparatus for the Relief of Writer’s Cramp”, *The Journal of Nervous and Mental Disease*, 1893, Volume 18(3) pp 194-196.

Robertson, R., “Family History in relation to contagion in Phthisis Pulmonalis” *The British Medical Journal,*1882, Volume 2, (1135) pp 624–626.

Robinson, E., “Cases of Telegraphists’ Cramp”, *The British Medical Journal* 1882, Volume 2 (1140) p 880.

Savage, G., “Overwork as a Cause of Insanity”, *The Lancet*, 1875, Volume 106 (2708) pp 85-87.

Sinclair, J., Thomson, T., *“Report of the Departmental Committee on Telegraphists’ Cramp”, The Lancet*, 1912, Volume 179 (4622) pp 888-890, Volume 179 (4623) pp 941-944, and Volume 179 (4624) pp1008-102.

Smith, M., Culpin, M., Farmer, E., 'A Study of Telegraphists' cramp', *Industrial Fatigue Research Board,* Report 43, 1927, pp IV-48. (London: His Majesty's Stationery Office, 1927).

Snell, S., "Miners' Nystagmus", *The Lancet*, 1875, Volume 106 (2706) p 81.

Snell, S., "Miners' (Colliers') Nystagmus", *The British Medical Journal*, 1884, Volume (1233), p 343.

Snell, S., "Miners' Nystagmus", *The British Medical Journal*, 1887, Volume 2 (1386) p 218.

Snell, S., "Miners' Nystagmus", *The British Medical Journal*, 1887, Volume 2 (1390) p 434.

Solly, S., "Scriveners' Palsy or the Paralysis of Writers, Lecture I", *The Lancet,* 1864, Volume 84 (2156) pp 709-711.

Solly, S., "Lectures on Scriveners' Palsy, Lecture II" *The Lancet,* 1865; Volume 85, (2161) pp 84-86.

Solly, S., "Lectures on Scriveners' Palsy, Lecture III" *The Lancet,* 1865, Volume (2162) pp 113-115.

Spielman Raphael, W., Roberts, G.H., 'The selection of telephone operators', *The Human Factor,* Volume VI (11), 1932.

Taylor, C.B., "Miners' Nystagmus", *The Lancet,* 1875; Volume 105 (2702) pp 821-822.

Watteville, A de., "The Cure of Writers' Cramp", *The British Medical Journal*, 1885, Volume 1 (1259) pp 323-324.

Watteville, A de., "Further Observations on the Cure of Writers' Cramp", *The Lancet, 1885,* Volume 125 (3218) pp 790-791.

Wilkes, S., "Abstract of a Lecture on the Therapeutic Use of Electricity", *The British Medical Journal,* 1873, Volume 1 (628) pp 28-30.

Wilks, S., "On Overwork", *The Lancet*, 1875, Volume 106 (2705) pp 886-887.

Williams, C., "The Contagion of Phthisis", *The British Medical Journal,*1882, Volume 2, (1135) pp 618-620.

Wolff, J., “The Successful Treatment of Writers’ Cramp”, *The British Medical Journal*,1887, Volume 2 (1403) p1131.

Wolff, J., “The Treatment of Writers’ Cramp and Allied Muscular Affections”, *The British Medical Journal*, 1890, Volume 2 (1542) pp165-166.

Government Reports

Second Report of the Postmaster General 1856 (London: His Majesty’s Stationary Office 1856).

Seventeenth Report of the Postmaster General 1871(London: His Majesty’s Stationary Office 1871).

Forty-second report of the Postmaster General 1896 (London: His Majesty’s Stationary Office 1896).

Forty-fourth report of the Postmaster General 1898 (London: His Majesty’s Stationary Office 1898).

Report of the Department Committee on Compensation for Industrial Diseases, Report (London: His Majesty’s Stationary Office 1907.)

Second Report of the Department Committee on Compensation for Industrial Diseases 1908, Minutes of Evidence and Appendix (London: His Majesty’s Stationary Office 1908).

Report of the Department Committee on Telegraphists’ Cramp 1911 (London: His Majesty’s Stationary Office 1911).

Report of the Committee on the Inland Telegraph Service (London: His Majesty’s Stationery Office, 1927).

Newspaper / Magazine Reports

‘Workmen’s Compensation’, National Observer and British Review of politics, economics, literature science and art, May 8, 1897.

‘Employers and the Workmen’s Compensation Act’ Saturday Review of Politics, Economics, Literature science and art, July 2, 1898; 86, 2227.

Wilson, M., ‘Employers’ Liability and Workmen’s Compensation’, *Westminster Review,* February 1898, 149.

Telegraph Age, 1906, Vol 24: p x.

Telegraph Age, 1906, Vol 24: p xii.

‘Department Committee on Telegraphists’ Cramp.’ *Manchester Guardian*, March 29th, 1910.

‘Department Committee on Telegraphists’ Cramp.’ *The Scotsman*, April 2nd, 1910.

SECONDARY SOURCES

Books

Arksey, H., *RSI and the Experts, the Construction of Medical Knowledge* (London: UCL Press, 1998).

Bartrip, P.W.J., Burman, S., *The Wounded Soldiers of Industry: Industrial Compensation Policy,* 1833 -1897 (Oxford: Oxford University Press, 1983).

Bartrip, P.W.J., *Workmen’s Compensation in Twentieth Century Britain (*Aldershot: Gower Publishing Company Ltd, 1987).

Bartrip, P.W.J., *The Home Office and the Dangerous Trades: Regulating Occupational Disease in Victorian and Edwardian Britain* (New York: Rodopi, 2002).

Black, C., *Working for a Healthier Tomorrow: Review of the Health of Britain’s working Population* (London: HSE Books, 2008).

Bowker, G.C., Starr, S.L., *Sorting Things Out, Classification and its Consequences* (London: The MIT Press, 2000).

Clinton, A., *Post Office Workers: A Trade Union and Social History* (London: George Allen and Unwin, 1984).

Cooter, R.J., Pickstone, J.V., (eds), *Medicine in the Twentieth Century* (New York: Rodopi, 2000).

Dembe, A., *Occupation and Disease - How Social Factors Affect the Conception of Work-Related Disorders* (London: Yale University Press, 1996).

Fleck, L., *Genesis and Development of a Scientific Fact* (Chicago: University of Chicago Press), second edition, edited by T Trenn and K Merton, 1979).

Foucault, M., *The Birth of the Clinic* (London: Tavistock Publications, 1973).

Gijswijt-Hofstra, M., Porter, R., *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001).

Harrison, B., *Not only the 'Dangerous Trades'. Womens' Work and Health in Britain 1880-1914 (*Basingstoke: Taylor and Francis, Basingstoke, 1996).

Health and Safety Executive*, Musculoskeletal Disorders, Mental Health and the Work Environment,* HSE Research Report 316 (Norwich: HSE Books, 2005).

Health and Safety Executive*, Upper Limb Disorders in the Workplace*, HSG60 (Norwich: HSE Books 2002).

Health and Safety Executive, *How the Courts are Interpreting HSE Guidance and Health and Safety Regulations – An Exploratory Study of Court Judgements in Personal Injury Claims for WRULDs,* Research Report 010 (Norwich: HMSO, 2002).

Health and Safety Executive, *Work with Display Screen Equipment (Display Screen Equipment) Regulations 1992, as amended by the Health and Safety (Miscellaneous Amendments) Regulations, 2002* (London: HSE Books, 2003).

Jackson, M., *The Age of Stress - Science and the Search for Stability* (Oxford: Oxford University Press, 2013).

Jones, H., *Health and Society in Twentieth Century Britain* (Harlow Essex: Longman Group, 1994).

Karasek, R., Theorell*,* T.*, Healthy Work - Stress, Productivity and the Reconstruction of Working Life*, *(*USA, Basic Books, 1990).

Kieve, J.L., *Electric Telegraph A Social and Economic History* (Newton Abbot: David and Charles, 1973).

Killen, A., *Berlin Electropolis: Shock, Nerves and German Modernity.* (Los Angeles: University of California Press 2006).

Kuhn, T.S., *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 50th Anniversary edition, 2012).

Kuorinka, I., Forcier, L., (eds) *Work related Musculoskeletal Disorders (WMSDs): A reference book for prevention* (London: Taylor and Francis, 1995).

Long, V., *The Rise and Fall of the Healthy Factory: The Politics of Industrial Health in Britain, 1914-1960* (Basingstoke: Palgrave Macmillan, 2011).

McIvor, A.J., *A History of Work in Britain* (Basingstoke: Palgrave Macmillan, 2001).

McIvor, A. J., *Miners' Lung: A History of Dust Disease in British Coal Mining* (Oxford: Ashgate, 2007).

McKeown, T., *The Modern Rise of Population* (London: Edward Arnold, 1976).

Moon, S, D., and Sauter, A., (eds) *Beyond Biomechanics Psychosocial Aspects of Musculoskeletal Disorders in Office Work.* (London: Taylor and Francis, 1996).

Morus, I.R., *Shocking Bodies: Life, Death and Electricity in Victorian England* (Stroud, Gloucestershire: The History Press, 2011).

National Research Council and Institute of Medicine, *Musculoskeletal Disorders and the workplace: low back and upper extremities.* Panel on Musculoskeletal Disorders and the Workplace*,* Commission on Behavioral and Social Sciences and Education (Washington DC: National Academy Press, 2001) p3.

Okunribido, O., Wynn, T*., Ageing and Work-Related Musculoskeletal Disorders, a Review of Recent Literature,* HSE Research Report 799 (Norwich: HMSO 2010).

Pheasant, S., *Ergonomics Work and Health* (Basingstoke: Macmillan Press, 1991).

Pheasant, S., *Bodyspace – Anthropometry, Ergonomics and the Design of Work,* (London, Taylor and Francis, 2001).

Porter, D., *Health, Civilisation and the State (*London: Routledge, 1999).

Rabinbach, A., *The Human Motor, Energy, Fatigue and the Origins of Modernity (*Berkeley and Los Angeles: University of California Press, 1992).

Rance, C., *The Quack Doctor, Historical Remedies for All your Ills,* (Stroud, Gloucestershire: The History Press, 2013).

Rosen, G., *A History of Public Health (*Baltimore: The Johns Hopkins University Press,1958).

Rosenberg, C., The Bitter Fruit: Heredity, Disease and Social Thought" in C Rosenberg, *No Other Gods- On Science and American Social Thought,* (Baltimore, Johns Hopkins University Press, Revised and Expanded Edition 1997).

Rosner, D., Markowitz, G., *Deadly Dust, Silicosis and the Ongoing Struggle to Protect Workers Health* (Ann Arbor, University of Michigan Press, 2006 (first edition 1991)).

Sellers, C.T., *Hazards of the Job*. *From industrial Disease to Environmental Health Science,* (London: North Carolina Press, 1997).

Thomson, M., *Psychological subjects: Identity, Culture, and Health in Twentieth Century Britain* (Oxford: Oxford University Press, 2006).

Waddington, K., *An Introduction to the Social History of Medicine* (Basingstoke: Palgrave Macmillan, 2011).

Weindling, P., *The Social History of Occupational Health* (London: Croom Helm, 1985).

Wohl, A.S., *Endangered Lives – Public Health in Victorian Britain* (London: Methuen,1983).

Worboys, M., *Spreading Germs Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000).

Wright, P., Treacher, A., (eds) *The Problem of Medical Knowledge - Examining the Social Construction of Medicine* (Edinburgh: Edinburgh University Press, 1982).

Articles

Arksey, H., "Expert and Lay Participation in the Construction of Medical Knowledge", *Sociology of Health and Illness,* Volume 16 (4), 1994, pp 448-468.

Armstrong, D., “The Doctor- Patient Relationship: 1930-1980” in P Wright and A Treacher (eds) *The Problem of Medical Knowledge - Examining the Social Construction of Medicine* (Edinburgh, Edinburgh University Press, 1982) p119.

Armstrong, TJ., Buckle, P., Fine, LJ., Hagberg, M., Jonsson, B., Kilbom. A., Kuorinka, IA., Silverstein, BA., Sjogaard, G., Viikari-Juntura, ER., “A Conceptual Model for Work-Related Neck and Upper-Limb Musculoskeletal Disorders”, *Scandinavian Journal of Work, Environment and Health,* Volume 19 (2), 1993, pp 73-84.

Brown, P., “Naming and Framing: The Social Construction of Diagnosis and Illness”, *Journal of Health and Social Behaviour*, Volume 35, 1995, pp 34-52.

Bufton, M, W., Melling, J., “Coming up for Air: Experts, Employers and Workers in Campaigns to be Compensate Silicosis Sufferers in Britain 1919-1939”, *Social History of Medicine, Volume* 18 (1), 2005, pp 63-86.

W Bynum, “Darwin and Doctors: Evolution, Diathesis and Germs in Nineteenth-Century Britain”, *Gesnerus,* Volume 40, 1983, pp 46-47.

Chadaverian, de S., “Graphical Method and Discipline: Self-Recording Instruments in Nineteenth-Century physiology”, *Studies in History and Philosophy of Science Part A,* 1993; Issue 2: pp 267-291.

Dale P., Greenlees J., Melling J., “The kiss of death or a flight of fancy? Workers’ Health and the Campaign to Regulate Shuttle Kissing in the British Cotton Industry, c.1900-52,” *Social History,* Volume 32(1), 2007, pp 54-75.

Dierig, S., “Engines for Experiment’ Laboratory Revolution and Industrial Labor in the Nineteenth–Century City”, *OSIRIS*, 2003, Volume 18, pp116-134.

Edmonds, O.P., Edmonds, E.L., “An Account of the Founding of HM Inspectorate of Mines and the Work of the First inspector Hugh Seymour Tremenheere”, *British Journal of Industrial Medicine*, 1963, Volume 20 pp 210-217.

Figlio, K., “Chlorosis and Chronic Disease in Nineteenth- Century Britain: The Social Construction of Somatic illness in a Capitalist Society”, *Social History,* Volume 3 (2), 1978, pp 167-197.

Figlio, K., “How does Illness Mediate Social Relations? Workmen’s Compensation and Medico Legal Practices 1890- 1940*”* in P Wright and A Treacher A (eds) The *Problem of*

*Medical Knowledge - Examining the Social Construction of Medicine (*Edinburgh, Edinburgh University Press, 1982) pp 174-224.

Figlio, K., "What is an Accident?" in Weindling, P., *The Social History of Occupational Health* (London: Croom Helm, 1985) pp 180-206.

Hacking, I., "Introductory essay'' in TS Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 50th Anniversary edition, 2012); ppxii.

Harrison, B., ''Are Accidents Gender Neutral? The Case of Women's Industrial Work in Britain 1880-1914''. *Womens History Review*, Volume 2(2),1993, pp 253-275.

Harrison, B., "The Politics of Occupational Ill Health in Late Nineteenth Century Britain: The Case of the Match Making Industry"*. Sociology of Health and Illness*, Volume 17(1),1995, pp 20-41.

Holdsworth, C., "Dr John Thomas Arlidge and Victorian Occupational Medicine", *Medical History,* Volume 42, 1998, pp 458 -475.

Ineson, A., Thom, D., "TNT Poisoning and the Employment of Women Workers in the First World War" in Weindling, P., *The Social History of Occupational Health* (London: Croom Helm, 1985). pp 89-107.

Jordanova, L., "The Social Construction of Medical Knowledge", *Social History of Medicine,* Volume *7* (3), 1995 pp 361-381*.*

Kipping, M., "Consultancies, Institutions, and the Diffusion of Taylorism in Britain, Germany and France,1920s to 1950s"*. Business History*, Volume 39(4), 1997, pp 67-83.

Kuorinka, I., Jonsson, B., Kilbom, A., Vinterberg, H., Biering-Sorensen, F., et al, "Standardised Nordic Questionnaires for the Analysis of Musculoskeletal Symptoms", *Applied Ergonomics,* Volume 18 1987, pp 233-237.

Kreis, S., "Early Experiments in British Scientific Management: the HMWC 1915 -1920", *Journal of Management History*, Volume 1 (2) 1995, pp 65-78.

Kwiatokowski, R.,Duncan, D.C., Shimmin,S. "What have we forgotten and why?" *The Journal of Occupational and Organizational Psychology,* Volume 79 2006, pp 183-201

Lee, W.R., “Emergence of Occupational Medicine in Victorian times”, *British Journal of Industrial Medicine*, Volume 30 1973, pp 118-124.

Lowy, I., “Introduction: Ludwick Fleck’s Epistemology of Medicine and Biomedical Sciences”, *Studies in History and Philosophy of Biological and Biomedical Sciences*, Volume 35 2004, pp 437-445.

Lowy, I., “Ludwick Fleck on the Social Construction of Medical Knowledge”, *Sociology of Health and Illness,* Volume *2* 2004, pp 131-151.

MacCallum, R.I., “Sir Thomas Oliver (1853-1942) and the Health of Antimony Workers”, *Vesalius* IX, Volume 1, 2003, pp13-19.

Malone, C., “The Gendering of Dangerous Trades: Government Regulation of Women’s Work in the White Lead Trade on England, 1892-1918”, *Journal of Women’s History* Volume (1) 1996, pp15-35.

Marland, H., “Uterine Mischief? WS Playfair and his Neurasthenic Patients”, in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001), pp 117-141.

Mason, A., “Rub, Rub, Rubbish: Massage in the Nineteenth Century”, *Physiotherapy,* September 1992, Volume 76 (9) p 666.

Melling, J., “The Risks of Work and the Risks of Not Working: Trade Unions, Employers and Responses to the Risk of Occupational Illness in British Industry c1890-1940s”, *ESRC Discussion paper 12.* (London: ESRC Centre for Analysis of Risk and Regulation, 2003);

Melling, J., *“*Beyond a Shadow of a Doubt? Experts, Lay Knowledge and the Role of Radiography in the Diagnosis of Silicosis in Britain, 1919-1945”, *Bulletin of the History of Medicine*, Volume 3, 2010, pp 424-466

McIlvenna, K., Brown, D., Green, D., “The Natural foundation of Perfect Efficiency’ Medical Services and the Victorian Post Office”, *Social History of Medicine* published online January 23rd 2019. Available from http://dx.doi.org/10.1093/shm/hky123, last accessed 10/05/2019.

McIvor, A., “Manual work, Technology and Industrial Health, 1918 to 1939”*, Medical History,* Volume 31 (2) 1987, pp160-189.

McIvor, A., “Employers, the Government and Industrial Fatigue, 1890-1918”, *British Journal of Industrial Medicine,* Volume 44, 1987, pp 724-732.

McIvor, A., “Germs at Work: Establishing as an Occupational Disease in Britain, c.1990-1951”, *Social History of Medicine,* Volume 25(4), 2012, pp 812-829.

Poirier, S., “The Weir Mitchell Rest Cure: doctors and patients”, *Women’s Studies,* 1983, Volume 10, pp 15-40.

Porter, R., “Nervousness, Eighteen and Nineteenth Century Style” in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia*, *From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001), pp 31-51.

Quintner, J., “Apropos Rub, Rub, Rubbish: Massage in the Nineteenth Century”, *Physiotherapy,* January 1993, Volume 79 (1) p 32.

Rose, M.E., “The Doctor in the Industrial Revolution”, *British Journal of Industrial Medicine,* 1971, Volume 28 pp 22-26,

Rosenberg, C., “Disease in History: Frames and Framers”’, *The Milbank Quarterly*, Volume 67 (supplement 1), 1989, pp1-15.

Rosenberg, C., “Framing Disease: Illness, Society and History”, in C Rosenberg and J Golden (eds.), *Framing Disease: Studies in Cultural History* (Rutgers: Rutgers University Press, 1992) pp xiii-xxvi.

Rosenkrantz, B., “George Rosen- Historian of the field”, *American Journal of Public Health*, Volume 69 (2), 1979, pp165 -9.

Sauter, S., Swanson, N., “An Ecological Model of Musculoskeletal Disorders of Office Work” in Moon, S.D., and Sauter, A., (eds) *Beyond Biomechanics Psychosocial Aspects of Musculoskeletal Disorders in Office Work*. (London: Taylor and Francis, 1996), pp 3-22

Schmidgen, H., “Of Frogs and Men: The Origins of Psychophysiological Time Experiments, 1850-1865”, *Endeavour,* 2002, Volume 26 (4) pp 142-148.

Schuster, D., “Personalising Illness and Modernity: S. Weir Mitchell, Literary Women and Neurasthenia, 1870-1914”, *Bulletin of the History of Medicine*, 2005, Volume 79 (4) pp 695-722.

Sengoopta, C., “A Mob of Incoherent Symptoms? Neurasthenia in British Medical Discourse, 1860–1920”, in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001), pp 91-117.

Sicherman, B., “The Uses of a Diagnosis: Doctors, Patients and Neurasthenia”, *Journal of the History of Medicine and Allied Sciences*, 1977, Volume 32 (1) pp 33-54.

Slijkhuis, J., “Neurasthenia as Pandora’s Box?*”* in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001), pp 257-279.

Sturdy, S., “The Industrial Body”, in RJ Cooter and JV Pickstone (eds), *Medicine in the Twentieth Century (*New York: Rodopi, 2000), pp 217-234.

Szretzer, S., “The Importance of Social Intervention in Britain’s Mortality Decline c1850-1914: a Reinterpretation of the Role of Public health’*, Social History of Medicine*, Volume 1 (1) 1988, pp 1-37.

Terris, M., “George Rosen and the American Public Health tradition”, *American Journal of Public Health,* Volume 69 (2) 1979, pp173-176.

Thomson, M., “Neurasthenia in Britain: An Overview” in M Gijswijt-Hofstra and R Porter (eds.) *Cultures of Neurasthenia, From Beard to the First World War,* (Amsterdam, New York, Rodopi, 2001), pp 77-97.

Websites / Web Articles

Britannica, Rudolf Virchow biography, retrieved from http://www.britannica.com/biography/Rudolf-Virchow, last accessed 10/05/2019.

British Telecom, RSI pages, retrieved from http://home.bt.com/lifestyle/health/health-concerns/do-you-have-rsi-check-the-signs-and-symptoms-of-repetitive-strain-injury-11364034461597, last accessed 10/05/2019.

Chartered Institute of Ergonomics and Human Factors, “What is ergonomics and human factors?”, retrieved from https://www.ergonomics.org.uk/ , last accessed 10/05/2019.

Milnes, E., Tapley, S., “Mobile Working Risk Management System”. Retrieved from https://www.ergonomics.org.uk/Public/Resources/Publications/Mobile_Working.aspx, last accessed 10/05/2019.

Nunes, I. L., “Musculoskeletal disorders in the workplace”, retrieved from https://oshwiki.eu/wiki/Introduction_to_musculoskeletal_disorders, last accessed 10/05/2019

Oxford Dictionary of National Biography, Thomas Wemyss Fulton biography, retrieved from http://www.oxforddnb.com/view/article/57609 , last accessed 10/05/2019.

Oxford Dictionary of National Biography, William Gowers biography, retrieved from http://www.oxforddnb.com/view/article/33498, last accessed 10/05/2019.

Oxford Dictionary of National Biography, GV Poore biography, retrieved from http://www.oxforddnb.com/view/article/35571, last accessed 10/05/ 2019.

Oxford Dictionary of National Biography, Herbert Samuel biography, retrieved from http://www.oxforddnb.com/view/article/35928, last accessed 10/05/2019.

Oxford Dictionary of National Biography, Samuel Solly biography, retrieved from http://www.oxforddnb.com/view/article/25989, last accessed 10/05/2019.

Royal College of Surgeons, Dr Prynne biography, retrieved from https://livesonline.rcseng.ac.uk/biogs/E005291b.htm , last accessed 10/05/2019.

RSI Action, retrieved from http://www.rsiaction.org.uk/ last accessed 10/05/2019.

Science Museum, Telegraph equipment resources and images, retrieved from https://www.sciencemuseum.org.uk/objects-and-stories), last accessed 10/05/2019.

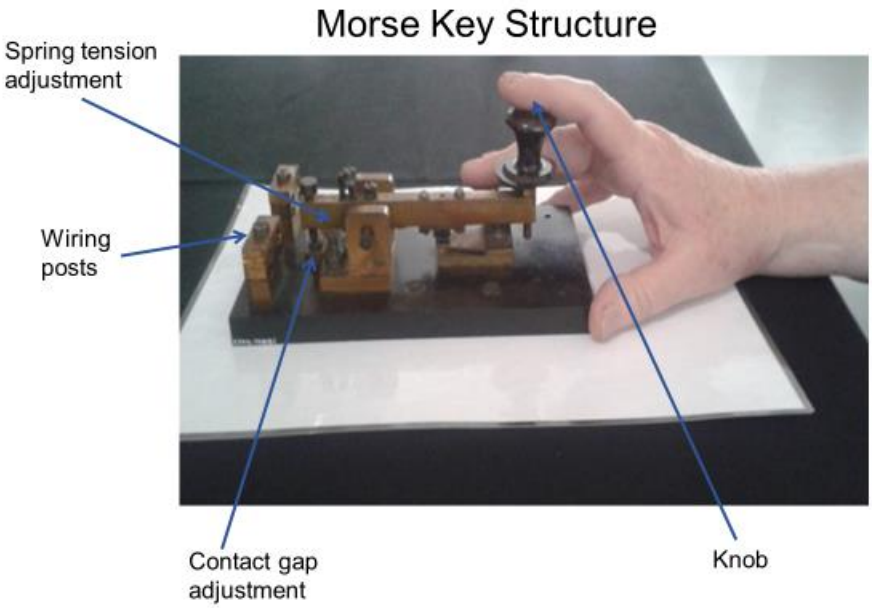
UK Health and Safety Executive, “Stress at work”, retrieved from http://www.hse.gov.uk/stress/, last accessed 10/05/2019.

UK Health and Safety Executive, “The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013”, retrieved from http://www.hse.gov.uk/riddor/occupational-diseases.htm, last accessed 10/05/2019.

UK Health and Safety Executive, “Work related musculoskeletal disorder statistics (WRMSDs) in Great Britain, 2018”, retrieved from http://www.hse.gov.uk/statistics/causdis/msd.pdf, last accessed 10/05/2019.

The World Health Organisation (WHO), ‘History of the development of the ICD’*, in WHO ICD10 Online*, retrieved from www.who.int/classifications/icd/en/, last accessed 10/05/2019.

Appendix A



(Photograph: authors personal collection).

Appendix B

A transcription of the workplace questionnaire sent to telegraphists as part of the 1910 Committee enquiry.[586] Note – comments in italic text indicate how the questionnaire was personalised when distributed.

Copy of circular sent to Telegraphists employed in the Central Telegraph Office and in large provincial offices with a separate telegraph staff.

M_____ (*note - individual name was inserted here*)

A committee is at present sitting to enquire into the prevalence and causes of the disease known as Telegraphists' Cramp and to report what means may be adopted for its prevention. Although satisfied that the great majority of staff is quite free from this trouble, the Committee feels it to be very important in the interests of the operators themselves that the actual number of persons, male and female, who feel whilst keying any symptoms, even thought not severe of pain, loss of control over the instrument, or other difficulty in sending, should be known.

It is earnestly requested that you will be good enough to assist the Committee answering the enclosed questions with care and absolute accuracy and handing the form **immediately** to your Superintendent sealed in the accompanying envelope. The form need not be signed if you specially wish that your name should not be known, nor is it essential that the answers should be in your own handwriting. The sole object of the Committee is the compilation of careful statistics.

SA Paterson,

Secretary to the Telegraphists' Cramp Committee.

28th April 1910

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[586] See p36, *Appendix 1, Report on the Departmental Committee on Telegraphists' Cramp.* The questionnaire can be found in sub Appendix B

OFFICE _____ (*details to be inserted*)

(_____ Staff)*

1. Age in years
2. Particulars of service with dates
3. How long have you been using the Morse key ?
4. Did you receive regular instruction? Or did you teach yourself as best you could?
5. Can you use either hand in sending? If do why did you learn to use your second hand?
6. **How many hours are you generally employed per day in:
    a. Up and down work?
    b. Sending?
    c. Receiving?
7. Have you ever felt whilst keying
    d. Pain
    e. Loss of control over the instrument
    f. Any other difficulty in sending

    If so, state when and in what circumstances the symptoms commenced, and describe them as clearly as you can.
8. Have you any explanations of your own of these symptoms (e.g. fatigue, rheumatism, indifferent health etc)?
9. Have the symptoms continued the same to the present time or have they ceased or altered their character, and do you always experience them whilst keying?
10. Do you have any similar difficulty in doing other things besides keying such as writing, using knife and fork, needle etc?

Signature _____ Date _____

*Insert male or female as the case may be

** If you are employed on rotating duties give these particulars in respect of the week ended Saturday last.

Appendix C

A summary of my further analysis of evidence sources which the 1910 Committee used to generate causative factors for telegraphists' cramp.

Evidence examined	Causative factor identified	Committee conclusion
• Considerable % of telegraphists were of nervous temperament (although some developed this after the onset of cramp). • Strong and healthy telegraphists developed cramp.	Individual constitutional weakness	• No specific connection identified, but the possibility that there is a greater liability of neurasthenic persons to develop cramp.
• Recruitment by competitive entrance exam results take precedence over practical experience. • Aptitude of successful candidates. • Age of recruitment.	Inaptitude for telegraph work	• No evidence to link recruitment of successful candidates to cramp development, however those with inaptitude likely to suffer fatigue and strain and were liable to cramp. • Learning more difficult for those aged 17 and upwards. • Rules for dealing with learner inaptitude (i.e. by contract termination) need to be fully enforced throughout the telegraph service.
• PTCA 1908 evidence on sending rates. • 1911 PTCA evidence: muscular failure due to Post Office demanding higher work rates and fear of failure to achieve ("average system" requires 24 messages per hour). • PTCA witness statements. • Periodical telegraphic traffic returns analysed from larger offices and compared to USA sending rates (average 30 to 32 messages per hour). • PTCA request for lesser rates per hour for young telegraphists.	Nature and amount of work	• Telegraph annual returns were solely for improving the Post Office with the object of setting a UK standard, they were not for comparing individual work performance. • 24 messages per hour agreed with PTCA as a standard for qualified operators. • Work rates not deemed to be excessive or likely to cause strain in those with normal nerve stability.

Evidence examined	Causative factor identified	Committee conclusion
• PTCA witness statements. • Current work schedules: progressive, so heavier circuits worked by senior telegraphists; Simplex / Duplex circuit differences explained in terms of work strain – Simplex circuits require alternate sending and receiving (variation and less work strain); Duplex require two telegraphists: one sends continually and the second receives continually (leads to fatigue and strain). • Evidence of work rates and shift patterns on newspaper circuits (special wires) and heavier circuits which require 12-hour night shifts on alternating weeks, worked over three-year period.	Arrangements of work duties	• Post Office aimed to show greatest consideration in arranging schedules to afford variety and equanimity. • Evidence indicated duties not as arduous as reported. • Experienced telegraphists on heavy / special circuits rarely contracted cases (1.9% of this group since 1902).
• Telegraph annual returns for staffing levels, analysis of work returns, overtime records.	Office staffing levels and overtime	• No evidence of abnormal staffing levels. • Amount of overtime worked not excessive or likely to cause fatigue.
• Witness statements	Bad manipulation style	• Bad sending style can lead to cramp and vice versa. • Style of sending is a personal characteristic. • Smaller offices had poor / unsatisfactory arrangements for learners.

Evidence examined	Causative factor identified	Committee conclusion
• PTCA evidence for changed conditions for young workers in CTO (from previous deputations to Sydney Buxton). • CTO training regimes. Qualifying periods (12 months). • Telegraph experts evidence of young telegraphists working heavy circuits too early and becoming overworked. • Technical difficulties caused by poor electrical conditions, stressful for younger telegraphists.	Too early responsibility	• Training of leavers and their employment soon after need further consideration. • Degree of proficiency expected after 12 months training is acceptable. • Rates of working among young telegraphists were not excessive but dealing with important messages could prove stressful. • After 2 years most telegraphists should be capable of taking charge of simpler Morse circuits. • After 4 years, anyone of normal health should be assigned to any duties required.
• Sharing postal work in amalgamated Post Offices (involved heavy lifting in some instances).	Heavy manual work	• No objections as provided work variety.
• Evaluation of types of Morse key and mode of use (e.g. single current - hard contact keys and double current – spring contact keys).	Morse keys	• No definite opinion on type. Balance of opinion was that spring contact keys were better for heavier circuits.
• PTCA statements on inadequate table space, led to strained sending and cramp.	Inadequate work conditions	• Standard space (according to Engineer in Chief standard) must be provided